



DECEMBER 1999

Volume 67 No 12

Amateur Radio

Journal of the Wireless Institute of Australia



ROSS A. HULL 1902 - 1938

- * The Ross Hull Story
- * The End of an Amateur Radio Era
- * An AM/CW Transmitter
- * A Spectrum Attenuation Measuring Set
- * High Sea Antennas
- * An Inconspicuous Antenna

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Amateur Radio

Volume 67
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December 1999

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Our cover this month

Front cover picture of Ross Hull: Ross A Hull 1902-1938

Contributions to Amateur Radio

Amateur Radio is a forum for WIA members' amateur radio experiments, experiences opinions and news. Manuscripts with drawings and/or photos are always welcome and will be considered for publication. Articles on disc or email are especially welcome. The WIA cannot be responsible for loss or damage to any material. A pamphlet, How to write for Amateur Radio is available from the Federal Office on receipt of a stamped self-addressed envelope.

Back Issues

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Photostat copies

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Disclaimer

The opinions expressed in this publication do not necessarily reflect the official view of the WIA and the WIA cannot be held responsible for incorrect information published.

Amateur Radio Service

A radiocommunication service for the purpose of self-training, intercommunication and technical investigation carried out by amateurs; that is, by duly authorised persons interested in radio technique solely with a personal aim and without pecuniary interest.

Wireless Institute of Australia

The world's first and oldest
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Founded 1910

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The Australian Amateur Radio Service

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EDITORS COMMENT

Guest editorial
by Evan Jarman VK3ANI

Y2K compliance: a reminder

In an attempt to give our editor time to clear his desk, some of his many and various tasks have this month been taken up by other members of the Publications Committee. To me comes the editorial comment and some proofreading.

As previously announced, Bill Rice is retiring as editor of *Amateur Radio*. Our beloved editor readily admits that his editorship lacks Y2K compliance. I wish Bill Rice a happy new year and all the best in his second retirement. Time to throw out the production schedule and replace it with an on air sked.

Eric Jamieson VK5JPL has written his final VHF-UHF column this month. More will be said about Eric next month but we on the Publications Committee would like to say *thank you Eric*. Your efforts have been appreciated.

But these are not the only big changes to occur; computers are facing a watershed.

When the year changes to 2000, tragedy has been predicted by doomsday merchants having a picnic. Recently some airlines have indicated that they will not have any aircraft in the air when the clock ticks over to the new year. This is not because they don't trust their systems. It's due to customers limiting their reliance on any equipment when the change takes place. These airlines simply cannot sell enough tickets on the scheduled flights.

In business, a lot of people have made a lot of money checking, and rechecking, computer systems to eliminate all problems. A bank CEO recently wrote to all customers to assure them that the bank has thoroughly checked and now guarantees that they will have no problem with the bank's services. I was then a little distressed to read about the Tasmanian council in *Spotlight* on *SWLING* this month. I still accept my bank's guarantee.

It is now expected that the most widespread problem will be the lack of preparedness with personal computers at home.

As an example, the executive office has checked its systems: a group of personal computers. They did a simple BIOS test and half of the office computers failed. The problem is not terminal and a procedure is now in place to overcome it. Have you checked your PC?

One member of the Publications

Committee mentioned putting the date forward to the end of the year on his laptop as a check. The year ticked over as expected he announced proudly. "*Can't understand what all the fuss was about*". It too failed the BIOS test.

But it doesn't mean that computers that do fail (usually older models) are immediately obsolete. Various devices have been tried to circumvent the problem. I am aware of at least two major industry systems where the solution was to wind the clock back 28 years. The day and date (the year is not displayed) align and these systems are now on line with their customers unaware that the computer is using a date prior to the equipment existing. Unlike home computers, these are mainframes that simply could not be replaced in time. Twenty eight years is considered sufficient time to find a replacement but there is always the option of cranking the clock back again.

But back to the humble PC. I suspect that most amateurs would have one; probably an older model. It doesn't hurt to check your PC, but be careful. If you use one of the Y2K test programs, remember that they may change the date and then test systems. This can be embarrassing. I am aware of a household accounts package that checks the data files for currency (ie up to date) and if they are more than six months old, they are deleted. How did the user find out? After using a Y2K test program, the data was gone. Always keep back up copies!

The PC being used to prepare this text is known not to be Y2K compliant. But like most it should not be a problem. It just requires being ready before turning on for the first time next year. But you should be aware of the potential problem; before switch on occurs. Be like the scouts; be prepared.

The check required is easy and recommended. It's published in an AMSAT article in *Amateur Radio* March 1999 page 40.

Please remember that behind all this Y2K fuss is the new millennium that awaits.

May none of your worries be Y2K compliant. Have a happy new year, new decade, new century and new millennium.

ar



DX Window compromise

In October the WIA/ACA Liaison Committee met with the ACA and commercial users in Canberra to progress the request by WIA for a larger 80 metre DX Window.

The ACA had previously tabled a paper containing three possible options for the DX Window. In June we responded with a further submission rejecting the first two options (which failed to achieve our objectives), but finding merit in the third option to extend the existing very narrow Window to a 24 kHz segment below 3800kHz. The major hurdle was the number of commercial users licensed to operate in this segment.

At the October meeting the WIA submitted a further paper indicating how the amateur radio service could share with the incumbent commercial users. The ACA complemented the WIA on its submissions but was not prepared to accept such a sharing plan. Instead, the ACA proposed that the 24 kHz DX Window be allocated to the amateur service as sole users, once the established commercial users had been able to relocate to other frequencies outside the 80 metre amateur band.

An implementation schedule was proposed that will make the full DX Window available to the amateur radio service as soon as possible, taking into account the need for changes to the Australian Radio-frequency Spectrum Plan following WRC2000. Full clearance of commercial users is expected by 2004. Effective immediately, ACA will make new frequency assignments in the 24 kHz segment.

Although the implementation period is much longer than the WIA desires, it is a practical solution and one we consider fully acceptable. There may be an opportunity to shorten the period or phase-in part of the Window at an earlier date should the commercial users be able to move out of the band at a faster rate. The WIA expressed a desire to assist the ACA in any way it could to achieve earlier access.

Another meeting with the ACA is scheduled for this month, December. As I write this in November the Agenda is still being compiled but it will likely include further discussion on a LF Band allocation, the examination service, licensing matters, possible EMR regulations and other topical issues for the Australian amateur radio service.

As we approach the end of another year I would like to thank again all of the many volunteers who work tirelessly for the WIA in their many roles. Without our coordinators and regular columnists the WIA would not be the force it is.

On behalf of the WIA Federal Council and Executive, I extend greetings to all of our members. We wish you a Happy Christmas and Best Wishes for the New Year. I hope that 2000 will be a year of success for each of you in your particular area of amateur radio activity.

ar

Progress on 80m DX Window

Friday 5th November saw a meeting between the WIA/ACA Liaison Committee and the ACA. You will recall this concerned the application by the WIA to expand the 80 Metre DX window to bring it in line with the overseas allocation of this portion of the 80 Metre Band.

In a nutshell, the WIA wanted to expand the Band to cover 3775 kHz to 3800 kHz and asked that this expansion become available immediately on a shared basis. At present there are around 40 licences on issue for this part of the spectrum.

It was suggested by the ACA that a gradual relocation of these users was the obvious way to go.

These users would agree the relocation on the following basis:

- That the moves would NOT be made immediately, but gradually.
- That any move before this would be at the cost of the WIA
- That the move would need to be to a frequency close to where they were at the moment.

Agreement was reached on these matters.

The ACA on the 8th November, 1999, issued instructions throughout VK to all offices that there are to be NO FURTHER ALLOCATION in the frequency range of 3776 to 3800 kHz from that date.

It is hoped that all necessary legalisation etc. will be complete by sometime in 2004.

Rick Warnett P29KFS has noted Papua New Guinea (PNG) uses some of the 80M band for commercial land mobile allocations, however the 'Hams' share part of the band with those commercial services on a very informal "non-interference" basis.

Most VK/P2 traffic overlaps to a greater or lesser degree dependent on time of day and sunspots, almost always hearing VK's after 1830 EST which would make for problems with many fixed land stations in PNG if VK amateurs were running high power. Most P2 service users use 100W transmitters and often, low-efficiency antennas.

The next ACA Liaison meeting is scheduled for December 9.

(Michael VK2YC for the WIA / ACA Liaison Committee, VK2News, and P29KFS via QNEWS)

ACA-WIA LIPDs

Low Interference Potential Devices on 433.050 - 434.790 MHz

In 1998, the Australian Communications Authority (ACA) amended the Low Interference Potential Devices Class Licence determination to include operation of devices on the band 433.05 to 434.79MHz, in line with a similar frequency band that is available in most CEPT countries in Europe (ITU Region 1).

My apologies for not compiling a WIANews column last month... the demands of Real Life (tm) pushed Amateur Radio matters into the background. Like most WIA volunteers, I perform multiple jobs, which means I get overloaded occasionally. Unfortunately, many people assume that "The WIA" will do all necessary work, conveniently forgetting that it eventually comes down to a few dedicated individuals "doing the actual doing"... I wonder how much the overall performance of the WIA would improve if more members were willing to take on just one volunteer job, won't you?

Richard Murnane

The result of this decision by the ACA is that significant occurrences of interference have been observed on Amateur 438/433MHz band FM repeater systems right across Australia. The ACA's original proposal was strongly rejected by the Wireless Institute of Australia (WIA) when it was first mooted and the WIA's stand has now been vindicated.

After reading the ACA LIPD determination papers it would appear the ACA is REQUIRED to remove any offending LIPD interference from amateur operations.

The Amateur Radio Service, by this determination, is not required to tolerate interference from LIPDs, nor is the Amateur Radio Service required to modify its activities to avoid this interference, as the determination puts the responsibility back on the LIPD, and hence the ACA who must manage this interference!

LIPDs have NO PROTECTION from interference!

If, as an amateur radio operator, you believe that you are receiving interference from these devices, then you are encouraged to take the matter up with the ACA and to push for the ACA to remove the interference. If you encounter resistance from the ACA, then please contact VK5ZWI Grant Willis

In VK5 recently problems were solved by the Amateurs encouraging the channel change of an interfering crane controller. VK5ZWI says is unfortunate that throughout this exercise, despite the ACA's apparent obligations under the radiocommunications class license determination and the RadCom Act in general, that their assistance was minimal in resolving this issue, almost to the point of being detrimental.

The ACA consideration of existing licensed radiocommunications users appears virtually non-existent when considering the Amateur Service.

The fact that the ACA is quite happy for voice devices to be used in Australia, to effectively create another defacto CB band in an attempt to overrun the existing amateur service use of the band could perhaps be construed as sinister! There seems little merit in creating another CB band, when there is already a free CB service band around 477MHz as well as 27MHz. As a minimum, the amateur service in Australia must demand that the ACA place restrictions on all voice/audio equipment, in line with what current Region 1 practice generally appears to be.

Refer <http://www.ckk.net.au/areg/radio/lipd/lipd.html> for more information.

(via QNEWS, from a packet message posted by Grant Willis VK5ZWI)

Communications for 2000 Games

With less than a year to go before the Sydney Olympic Games, the Australian Communications Authority (ACA) has been working to ensure a reliable communications environment for the Games.

The internal organisation of the Games itself requires an extensive communications network, and when you add the broadcasting and media communications and the other visitors, the demands are staggering.

There is significant potential for problems such as interference and network disruption to occur.

The services to be provided by the ACA will include pre-games inspection of venues to anticipate telecommunications cabling and radiofrequency interference problems, radiocommunications licensing, radiofrequency interference investigation during the Games and equipment testing.

Prior to the Games a radio-communications audit of all facilities at each venue will be conducted, to ensure the electromagnetic compatibility of all devices used at these venues, and to ensure that the level of radio emissions from the devices does not exceed prescribed safety standards.

An equipment assessment service for communications equipment imported for use at the Games is also needed. This inspection work must be conducted in conjunction with other authorities, such as Testing and Certification Australia, to ensure both the electrical safety and electromagnetic compatibility of devices.

(ACA Media Release 57 of 1999)

Olympics Want 5 GHz

Michael Corbin VK2YC, a member of the WIA/ACA Liaison Committee says they are in discussion with the ACA regarding a request from the Olympic Organisation for use of frequencies in the 5.7 GHz Band for television broadcast links during the Olympic Games.

Many Amateurs will be aware that a new Amateur Satellite is due to be launched in the near future and will operate in this 5650-5670 MHz band, precisely the frequency proposed for Olympic use.

News of SOCOG's request prompted this response from Paul Rinaldo, W4RI of the ARRL:

There might be some basis for gently asking the Australian administration to avoid the band 5650-5670 MHz amateur-satellite Earth-to-space allocation per RR No. S5.282, perhaps with the suggestion to consider an alternative of 5670-5830 MHz.

This would clear the amateur-satellite band but may conflict with something else locally, such as ISM at 5800 MHz +/-75 MHz.

Nevertheless, this potential interference problem is bounded in a number of ways that make it of limited impact:

- (a) This assumes that P3D will be operational by the time of the Olympic games 15 September - 1 October 2000;
- (b) The time the TV removes use it should be limited just to a few weeks, affecting only the Sydney area;
- (c) While there is no fixed service allocation in the ITU Region 3 frequency table, nor in footnotes, Australia can make a NIB allocation on the basis of RR No. S5.43 "... a service may operate in a specific frequency band subject to not causing harmful interference, this means also that this service cannot claim protection from harmful interference caused by other services to which the band is allocated under Chapter SII of these Regulations."
- (d) The footnote under which the amateur-satellite service would operate uplinks in the band 5650-5670 MHz, as you know, states: "...the amateur-satellite service may operate subject to not causing harmful interference to other services operating in accordance with the Table (see No. S5.43)."
- (e) So I believe that the basis for the remote TV and amateur-satellites is of the same order of magnitude and who gets preference is within the sovereign power of the Australian administration.
- (f) Also, to keep things in context, this is a primary radiolocation band. This plus RR Nos. S5.451 (land mobile secondary in the UK) and S5.453 (fixed and mobile on a primary basis in many Region 1 and 3 countries) would appear to be a more significant problem than temporary remote TV use in Sydney.

Needless to say your WIA is opposing this temporary allocation.

(Paul W4RI/Bill WA6ITF via QNEWS)

ACA / WIA Cooperation

Still with the Olympics— During October, a series of training exercises were undertaken in and around Sydney by over 40 ACA personnel consisting mainly of Field and Technical Officers from all parts of Australia.

The exercises consisted of interference investigation and the testing of the Command Structure for the Olympic Games. According to Mr Vlies, Sydney ACA Manager, the exercises were very successful and he praised the cooperation received from the WIA's VK2 Division.

WIA VK2 provided interfering signals on the ACA Command frequency which the field officers, working in teams of three cars, had to identify and locate.

(From VK2WI News)

Changes to Club Portable Operation

Please be advised that it is no longer necessary for Amateur radio clubs to provide the Australian Communications Authority with details of proposed portable use of club callsigns.

Rather, as part of revised amateur club licence conditions, the clubs are required to maintain a club station log book. The log book must have details of:

- (i) a chronological record of all transmissions (including time/date);
- (ii) the frequency and type of emission used;
- (iii) the station(s) communicated with; and
- (iv) the name and callsign of the qualified person operating the station.

Other special conditions listed on your licence/s are:

"This Amateur station is a club station and must be operated in accordance with the Radiocommunications Licence Conditions (Amateur Licence) Determination No. 1 of 1997 that equals to the qualifications held by the operator of the station.

This licence authorises the operation of a class of licence Amateur Station at location of station".

Further details and questions should be directed to Ian Brown on (02) 9245-4097.

— Ian Brown of the Australian Communications Authority, via VK2WI

New Editor for Amateur Radio magazine

An Acting Editor has been appointed for the January 2000 edition of AR. He is VK5UE Colwyn Low. Colwyn is willing to be Editor for the year 2000 and a formal motion for his appointment will be circulated to Federal Councillors.

International Representative

Currently the WIA is discussing the expenditure and operation of our International Representative. Federal Council had requested a greater degree of accountability and reporting in future.

Examiners List

The possibility of refreshing the list of authorised examiners by calling for re-applications has been discussed but no resolution reached.

Sponsorship

The possibility of attracting sponsorships for the IARU Region III conference in Darwin also has been discussed and ideas sought.

Learning Amateur Radio via Internet

The Education officer of the VK1 Division is facilitating an on-line course on the Internet for Novice and AOCIP students. The course was developed by Ron VK2DQ and contains 43 readings that can be downloaded from his website, and covers the complete Novice and AOCIP syllabus.

At the end of the course, students apply and sit for the exam in the normal way. Aspiring radio amateurs, limited call holders, and Listeners are encouraged to make inquiries in the first instance at the Ron Bertrand's website.

The address is <http://members.xoom.com/ronber/amateur.html>. The facilitator is Peter VK1CPK.

VK2 news also reports the WIA is running a course on the web, also developed by Ron VK2DQ. See <http://www.ozemail.com.au/~vk2wi/Education.html>

(from VK1 and VK2 Divisional news, via QNEWS)

What a Buzz!

We've highlighted the US problem of VDSL over the weeks, Barry VK2AAB has pointed us to a web address where we can hear this "beast" so we can report it if and when it hits our shore.

For those of you coming in late, VDSL type systems use high speed data on "ordinary" phone lines. They use frequencies between 1.5 and 30 MHz and present an interference threat similar to the power line data systems.

<http://hamradio-online.com/> and go down the page to the article by WA7NBF near the bottom of the page. There are two clickable sound bites which will show you what we could be up against if VK carriers go ahead with these systems.

More Things that go Buzz in the Night

The HF buzz saw is dead; long live the HF "buzz saw!" That might be the cry from the crowd these days as various buzzing intruders have been showing up with some regularity on HF. Sometimes, though, it's hard to distinguish one intruder from the other on the basis of anecdotal reports from amateurs.

Recent reports of the so-called 125-Hz "buzz saw" intruder on the 80-metre band are a case in point. The intruder, heard

primarily in the US northeast, had plagued amateurs as well as an aeronautical weather station just below 80. In the wake of protests from amateurs and coordination between the ARRL and Radio Amateurs of Canada, the transmissions, determined to come from two HF surface wave radar facilities in Newfoundland, moved off the amateur band.

First ATV Repeater Licence granted in EI.

The Cork ATV group has been granted the first Fast Scan TV Repeater licence in EI and it operates in the 23cm band. What is unique about this project is that it was put together and set up by a white stick operator Aedan O'Meara EI3EG.

(John Barry EI8IR of IRTS)

(Note from Richard VK2SKY: some might be surprised by this news item, but I knew Aedan when I was living in Cork some fifteen years ago, sporting the callsign EI6BTB. Aedan's not one to let anything get in the way of his enjoyment of any aspect of Amateur Radio. I wish all Amateurs were as enthusiastic about this hobby.)

Still looking to the Stars

As of 22 October, 1999 the SETI@home (see "DX ET with Your PC", WIANews Aug 1999) has accumulated more than 100,000 years of computer time, more than any other computing project in history! The project has recorded over 85 million "candidate signals" (spikes and Gaussians) in its database, which will soon be subjected to a second phase of analysis, looking for "repeat events".

You can find the SETI@home web site, including a list of the Australian Amateurs participating in the project, by visiting the WIA Federal home page, clicking to the links index, and selecting "Space Exploration".

Free Publicity on Talkback Radio

While "cash for comment" has been in the news recently, it's worth remembering that you can get free publicity through various media channels, if you have something interesting to say.

In September, the Wahroonga Amateur Historical Radio Association operated Special Event Station VK2WAH, celebrating the anniversary of the first wireless message sent direct from Britain to Australia on 22nd September 1918.

One of the operators of the station this year, Ted Miles VK2FLB, earned some good publicity for Amateur Radio when he phoned the Alan Jones talk back show on radio station 2UE.

Alan Jones's ears pricked up when Ted mentioned that he was operating using Morse code - like many, perhaps Mr. Jones thought that CW was no longer in use, but Ted set him straight on that. Jones asked Ted to demonstrate CW on the program, sending the word "Alan", and a short message.

After Ted's "fifteen minutes of fame" ended, his phone started ringing, and Ted took a number of calls from 2UE listeners who wanted to find out more about radio communications. A nice publicity hit for Amateur Radio, and so easy to do - after all, don't we all like to talk on the radio?

There's a lesson to be learnt here: if you want to help the hobby of Amateur Radio to thrive, all you have to do is:

- enjoy your hobby
- be active
- do something a little out of the ordinary, and
- tell others about the fun you've had with Amateur Radio!

After all, Amateur Radio is too good to keep a secret, isn't it?

...and speaking of doing something out of the ordinary:

A Tram Ride into Space with Tony Langden VK3JED

Around lunchtime on Saturday October 2nd, 1999, the first successful QSO from a tram via an amateur satellite was conducted via an FM crossband repeater aboard the South African satellite, SUNSAT, otherwise known as OSCAR-35.

Considerable preparation went into the QSO, with attention being paid to the alignment of the tram relative to the satellite pass. In the end, a section of line running south from Airport West to Niddrie (Route 59) in Melbourne's north-western suburbs was chosen, which put the satellite square on the western side of the tram.

Just as the transponder finished sending its usual minute of data, the downlink signal improved sufficiently for a QSO and Jack, VK3WWW was heard on the downlink working a VK5. A call was put out to Jack and the first tram mobile QSO was logged, with a good report from Jack.

(Via the QNEWS Q-TINUOUS NEWS site, <http://www.wiaq.powerup.com.au/qnews/upload/qnews.htm>)

Radio on Rails successful

One world first and the smashing of a nine year old record. These are the early results from VK3's successful Radio on Rails Fun Day.

At noon Tony VK3JED became the first amateur to work through the Sunsat satellite from a moving train. Just a few weeks ago Tony made history for being first to work Sunsat from a moving tram.

A nine year old record was also broken during Radio on Rails. The record was the number of train mobile amateurs simultaneously participating in the one QSO. For a short time on Sunday afternoon there were four train mobile amateurs in contact via 70 centimetre VK3RCC repeater. These were VK3s KBD, JED, HEM and YE.

After being the first amateur station to work the Sunsat satellite as a passenger in a moving tram, and then in a train, Tony VK3JED has laid down a challenge for other train mobile Sunsat operators.

It's called the VK RailSat Challenge and is an attempt to make contacts between trains in various capital cities via amateur satellite.

More information on the VK RailSat Challenge appears on Tony's webpage at URL: <http://quest.apana.org.au/~tl/vk3jed/phtml>

(apcnws)
Trams, trains... what mode of transport will be next???

Amateur Radio magazine index online

Mike VK3KRO sure has been busy and has an almost complete index of our Amateur Radio magazine on his website.

It spans the period from October 1945 to December 1967 and is now available for downloading as shareware from his site, <http://www.autoscan.com.au>, which also has a comprehensive set of Amateur Radio links.

You can contact Mike via email to kroch@autoscan.com.au (via QNEWS)

Ring the Changes with Amateur Radio

Dick Smith VK2DIK, is Chairman of the National Council for the Centenary of Federation, an event still a year or so away.

VK2DIK plans to use CB and Amateur Radio operators for a project to ring church bells in relays right across the continent from Perth to Sydney.

It should take about two hours.

Everyone knows Dick Smith as an energetic, dynamo-like person with a clear idea of his targets and the paths he needs to tread, to reach them.

This story in the Orange and District Radio Clubs newsletter came from their local Observer newspaper article by a Mr Graham Cooke and is the first that I,

personally, have heard of Dick's plan to have the citizen radio fraternity (which he did so much to create in the mid- to late-70s) and amateurs share the ringing of celebratory bells for the Federation Centenary.

Nevertheless, when he engages with the WIA to organise for Australia's hams to help, I trust that each of us will do our best for this historic occasion. After all, how often have CB-ers and radio hams ever been called-upon to work together, let alone help coordinate the pulling of ropes to belt out tunes on bronze?

Whether it ends up as a cacophony of mis-tuned bells and mis-timed clangers, or the flow of beautiful peals across the countryside and the mathematical precision in the ringing of the changes, the plan has merit for the celebration.

So, fellow amateurs, go find the bells and, if you can, the CB-ers!

(Peter Carter VK2ETK)

Ricky to the Rescue!

A 10-year-old California ham recently used ham radio to help save the life of an injured fellow amateur. As a result, Ricky Rothbart, KF6VSH, of San Rafael, California, who only got his Technician ticket in April, received a Public Service commendation from the ARRL. He also gained a new appreciation of Amateur Radio's emergency service potential.

On August 28, Ricky was in the family car heading home from a trip to L.A. "Ricky was in the back seat absorbed in monitoring his favourite frequencies on his H-T," his dad, George Rothbart, KF6VSG, relates. "At about 6:10 PM, he suddenly said, 'Hey Dad, there's a guy on the radio who is bleeding all over the place and needs help!'"

It turned out the other ham had sliced his arm with plate glass and was bleeding profusely and asking on-the-air for medical help. The injured ham, Mike Lewis, KF6YDN, apparently was mobile in a remote area of Pittsburg, California, at the time and his cell phone was not working.

Ricky immediately replied, identifying himself and requesting the man's location and additional details. George Rothbart got on his cell phone, contacted a family member as Lewis had requested, then dialled 911. With Ricky working the emergency on his H-T, the Rothbarts were able to give the 911 dispatcher all the necessary information.

George Rothbart says he now knows "ham radio still works great, and through ham radio a 10-year old can make a difference."

(ARRL, via QNEWS)

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Division Notes

Parramatta commencing at 2 pm; and the Divisional office will close for the Christmas break at the end of trading on 23rd December and reopen on 10th January 2000.

As this is the last column for the year, the VK2 Councillors and all of us here at the office wish you the compliments of the season and may your holiday break be both safe and pleasant

VK1 Notes – Forward Bias

Peter Kloppenburg VK1CPK

A Novice class is about to start again in the ACT. Chris Davis (VK1DO) has volunteered to prepare aspiring amateurs for the Novice exam. For up to date details watch this space and/or listen to the weekly broadcasts on 3590 kHz every Sunday at 8:00 pm. Or, call me on (02) 6231 1790 for the latest.

Here is a bit of good news for VK1 members. To cover the cost of maintaining the WIA Federal Office in Melbourne, the federal component of your fee will be increased by \$7.50 per year. However, the committee has decided to absorb this increase by reducing the divisional component of your fee by the same amount. In addition to this good news is the fact that the GST will not apply to the membership fee!

Supported by the weather, Neil Pickford (VK1KNP) is organising weekly foxhunts again in the Belconnen area. The first one began this summer on October 28, 1999. The operating frequency is 146.2 MHz. Starting hunters gather at 14 Wales St, Belconnen at 6:30 pm every Thursday. Extra equipment can be borrowed from the hound's gathering point such as Spare Sniffers, Beams, and Attenuators from 6:50 pm onwards. For inquiries you can contact Neil by phone: (02) 6279 1322, Fax (02) 6279 1340, or Email: neilp@goldweb.com.au

Stop Press: The ACT Division is starting a Novice course for radio amateurs on February 2, 2000. An Information Evening will be held on January 26, 2000 for those who want to know more before they commit themselves. Address: Hughes Community Centre, Wisdom St, Hughes, 7.00 pm.

The next general meeting will be on December 27, 1999 in Room 11, Griffin Centre, Civic, Canberra City.

VK2 Notes

Pat Leeper VK2JPA

patleper@bigpond.com

The VK2 Division welcomes Brian Keegan VK2TOX as he takes his seat on Council, filling a vacancy that had arisen.

The Company Secretary, Treasurer and the office Administrative Assistant have attended a GST course run by MYOB as

preparation for fiscal changes in 2000. The office computer has been upgraded with a larger hard disk drive in readiness for this event.

Three new members and one associate member were accepted into the VK2 Division at the October Council meeting. They were: Paul Hanna VK2HV, Neil Jeffries VK2KYG, Richard Mackay VK2HRM and Robert Jones. We hope they have a long and fruitful association with the WIA.

By the time you read this, the second Affiliated Clubs Conference for this year will have been held, and, at the time of writing, registrations received show that the Conference is still growing in size and this will be the largest yet.

The Education Officer, Barry White VK2AAB, reported that Ron Bertrand, who did the original Gladsville Club educational videos, is running a free education course on the Internet based on that course, and has been looking for alternative tutors. The VK2 Council decided to take on a study group for this course, as well as running the Correspondence Course for those without Internet access. This would appear to be an opportunity to make the Internet work for Amateur Radio, rather than against it.

The Dural transmitter site has benefited with a donation of equipment from the NSW Police Department. An appropriate letter of thanks has been sent to the Commissioner.

In line with the current Council policy of supporting club field days and similar events, directors and office staff were in attendance at the Westlakes Field Day on Sunday 7th November with a complete selection from our book store, and items from our Deceased Estates section.

Members are reminded that our book store has a large selection of books on all aspects of amateur radio. Books may be ordered by mail by either cheque or credit card, and our selection of educational books is quite comprehensive. For more information on titles, ring the office on (02) 9689 2417.

A last reminder — the VK2 Division Christmas Party will be held on Saturday 11th December at Amateur Radio House



VK3 Notes

WIA Victoria News

By Jim Linton VK3PC

RD Contest - the rules stop us winning, again

The Remembrance Day Contest rules are being described by some members as a disgrace. We know they were rewritten some years ago with the objective of ending VK3's previous winning streak in this premier WIA contest.

However it was widely considered that with VK3 being the 1998 wooden spooners it had an excellent chance of winning this year.

The 1999 results have been released. They state that the most improved division this year was VK3. It came from last place in 1998 to a close second this year, and is an outstanding effort.

The question is now being asked. How VK3 can be the most improved, yet not be the winner?

Congratulations to the 1999 RD Contest winner, VK7, who with its small number of radio amateurs had managed to improve the performance that saw it win the contest last year.

Getting back to the rules. WIA Victoria also notes that the contest rules could be set to change again for next year, and you guessed it, the implication of the suggested change is targeted at VK3's use of automated packet contest robots.

Action flowing from the Special General Meeting

One important recommendation made by the members at the WIA Victoria Special General meeting held in October is destined to reshape the operation of the Federal WIA.

The meeting recommended that WIA Victoria seek the support of the VK2 Division and take positive action to rectify the current system of voting in the Federation.

Both VK2 and VK3 believe that the current system of one vote for each Division is inequitable as VK2 and VK3 members provide most of the funding for Federal.

Following recent discussions, VK2 and VK3 intend to have this situation changed in the immediate future and we simply want to be able to have better control over Federal expenditure of the monies we provide.

In short we both want proportional voting according to financial input and we hope to be able to achieve this by constructive negotiation with other Divisions.

In the event of negotiation being unsuccessful the future of the Federation as it now exists will be cast in considerable doubt. It is only sound business practice to require that funds are being used to benefit the provider.

Also from the Special General Meeting was a recommendation that WIA Victoria explore alternative publishing options for news and information including Amateur Radio magazine.

This matter has been raised at the first possible opportunity - during a recent WIA Federal teleconference.

The matter is now on the discussion agenda. WIA Victoria understands that the federal body is about sign new contracts for the production and publishing of AR magazine. These are likely to see the cost of the magazine increase substantially.

However WIA Victoria will continue to explore alternative means of providing news and information to its members, which includes the emerging multimedia.

Plenty of VHF/UHF activity

To promote greater use of simplex VHF/UHF frequencies, a new award called the WIA Victoria George Bass Diploma is now available. Who will be the first to qualify?

Tell your VK7 friends that they too can obtain this award! In fact any mainland radio amateur no matter where what their QTH can also qualify.

Full details of the award rules have been

sent to WIA Victoria members, affiliated clubs, and are posted on the WIA Victoria web site www.tbsa.com.au/~waviac

In addition, the web site now has a section devoted to VHF/UHF operation. It is written with the beginner in mind and includes topics such as propagation and antenna polarisation.

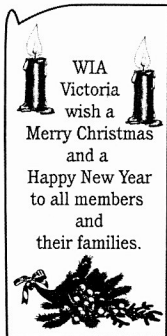
WIA 2000 Callbook delayed

The long awaited callbook was originally promised for delivery late September, or very early October, is now expected to be available this month.

WIA Victoria has been taking orders from members anxious to get their hands on the publication, and making inquiries of WIA Federal on a weekly basis about when deliveries can be expected.

WIA Victoria apologises to its members - however the circumstance is beyond our control, and not one of our making.

(Ed Note: There was a five-week delay in negotiating a suitable arrangement with the ACA for use of their database. The Callbook is to be out in late November.)



VK4 Notes - QNEWS

By Alistair Elrick VK4FTL
VK4 Councillor and QTC Editor

Meeting on the Go-ahead

The inaugural meeting of the Wireless Institute of Australia Queensland Division Incorporated was held on Saturday 30th of October at the Bronco's Leagues Club. The meeting went well with, as usual, some lively and at times protracted debate, but all

in good spirit, with the desire to progress the Division on into the year 2000.

A major announcement at this meeting was that the WIAQ Inc was once again a voting member of the WIA, as the Federal Office had received the outstanding monies. One of the items, on the appointment of the Auditor, was moved to have further investigation on the cost, with the results to be advised to the members when received.

The matter of fees for the year 2000 was hotly discussed with the result that the estimated increase required to cope with the rises from Federal due to GST, was carried. It was noted that there has been no fee increase since 1991. Unfortunately the fee increase has had to be done at the same time as the Federal rises are passed on.

Subsidising the running costs from the profits of the Bookshop and Disposals will be more prominent in the next few years, with funds to be directed to projects with, as suggested to the meeting, the future establishment of a permanent home for the WIAQ. Discussion on the return of the Membership Database to the Federal Office was postponed, due to the expected lengthy discussion which would have ensued on this matter.

Townsville to Charters Towers

The Townsville Amateur Radio Club Inc. visited Charters Towers on Saturday October 30th, where they paid a visit to Mrs. Joy Kerr. TARCinc member Ron Tulloch VK4BF presented Mrs. Kerr with a framed replica of the September 1999 Amateur Radio magazine front cover and article that he wrote about Vern Kerr VK4LK (SK). Vern was a technician with the RFDS from 1934 to 1977 and was honoured with the Vern Kerr Drive being named in recognition of his dedicated service to the community. A very kind gesture by TARCinc on behalf of the Amateur Radio fraternity.

Use it ...or else

John VK4HJP has been concerned with the lack of use on the 438.525 MHz repeater on Mt Coot-tha, so has decided to start a net. In a letter to the WIAQ, John asks as many as possible to join in, with possibly any subject open for discussion.

Wednesday nights at 8pm!

ALARAMEET

Sally VK4SHE reported on an excellent ALARAMEET in Brisbane, held at the RSL Club at Chermiside. About 80 were in attendance at this International Conference, all states except VK1 and VK8 were represented, with quite a few attendees from overseas. That is an excellent roll up of members and would be the envy of many organisations that sponsored an event such as this. Congratulations to the Ladies of

Amateur Radio. If you are an "Aussie" YL they would love you to join ALARA.

Just \$12.00 per year to the Treasurer is all it takes, and that is:

Bev Clayton, VK4NBC at 5 Lenz Street, Chermide Qld, 4032.

Next ALARAMEET will be in 2002 at Murray Bridge, SA.

New Club Warranted?

A group of amateurs in the Lockyer Valley (west of Brisbane) have formed a steering committee to canvas the local amateur population to see if a social amateur radio club is needed. To date the response has been excellent with approximately 20 potential members very supportive of a club in the area. A full meeting will soon be held to decide the direction of such a club.

If anyone would like any further information, please phone:

Alan VK4SN on 04 1137 3679 or Warren VK4FJ on (07) 5465 3219, or packet a message to either at VK4WIP, VK4FJ @ VK4WIP#IPS.QLD.AUS.OC or E-mail Neville VK4TNA at nevt @ hypermax.net.au

(Warren VK4FJ, Alan VK4SN and Neville VK4TNA.)

Those of us retired or semi-retired (or otherwise less fully occupied!), look forward to your company on the bands, particularly on the very challenging but less populated vhf-uhf bands which will be "humming" at this time of the season with increasing summer Es, tropospheric ducting, TEP etc... Likewise the HF dx bands will be in good shape, with interesting things happening on 15m and 10 m, due to the rapidly rising 23rd sunspot cycle.

If travelling, find room in your car or suitcase for some portable gear. Make full use of the salad days, or spend the long winter regretting - be there or be square!

Having said all that, I am very likely to be away in Africa through late Dec and nearly all of January, so much to my chagrin, will again miss out on the Ross Hull contest and some of the best of the propagation. No doubt I can expect to be informed on my return of all the mega-strength openings which have taken place in my absence (with everybody working the east-coast with 1 watt FM).

Hamfest '99

This annual event has just taken place at the time of writing. It was great to catch up and put a face to nearly the whole of the vhf group with whom I have been having daily skeds on 2m sideband. If for no other reason at all than to actually meet and talk to the "voices from the ether", it is certainly worth making the effort (200 km round trip in my case) to get to this event, although once again I came away with many useful bits and pieces. However there were no new rigs brought back to Toodyay this time - where were the suppliers to tempt us? (Not all were absent of course). Also the numbers attending appeared to be well down on last year. Do we have a chicken and egg situation here, or is there some other, more disturbing, explanation?

Avon Valley Repeater down! (But not out)

Sad, but true. Our 2m repeater (located outside Northam), is off the air at time of writing, the 100 ft mast having been brought down by a fierce late-winter storm. All guy wires were stretched with those supporting the middle giving way - as a consequence the 4-section tower collapsed in the centre, with the antenna lodged in the treetops holding all the "spaghetti" up off the ground. The tower has been removed to the QTH of John VK6BOC, who will apply his welding skills to the problem, with the assistance of Jim VK6CA and Ray VK6ET. This unhappy incident is of course also a setback for the UHF linking project. In the meantime some locals are using 146.500MHz simplex to meet.

CW Survey

The CW Retention/Abolition survey is currently under way. The survey is due to close at the Hamfest.

I am concerned that amateurs do not lose CW skills completely, as the ability to employ CW certainly helps with weak-signal vhf and other work, and it would be very frustrating not to be able to make/complete contacts into new "squares" or countries as a consequence. Non-compulsory CW may prove to be more attractive to prospective amateurs however. Perhaps a requirement to at least learn the alphabet would be a solution? I do find it ironical that I am now using CW daily for long-haul VHFcontacts!

From the Minutes (Nov. Council Meeting).

Some items of interest:

Membership:

One new member, Wayne VK6JR, was warmly welcomed to the Division.

Federal:

The possibility of refreshing the list of authorised examiners by calling for re-applications was discussed but no resolution reached. (BTW, I have just been appointed an accredited examiner - if you know of anyone east of the divide looking to sit, please contact me at the email address at the foot of the column). There is to be a meeting with ACA on 5th November 99 to discuss the 80m DX window.

General Business:

- (1) Greg VK6YEI advised that there had been three candidates for the last NCRG exam service examination.
- (2) Don VK6HK drew attention to the existence of Ron Bertrand's AOCPT training course on the Internet. The course was free and offered mediated assignments or self study. The web URL is: http://members.xoom.com/_XOOM/ronber/about.html.
- (3) Will VK6UU described an "incident" involving a "LIPD" transmission on the appropriate frequency of 152.025 MHz. The signal was radiated from the Darling Scarp as part of a link testing a remote HF receiver. ACA investigated what was thought to be excessive radiated power given the received signal level on the Perth coastal plain, but all was found to be in order.
- (4) Will VK6UU had obtained a copy of the VK4 motion about having a consultant investigate the structure of the WIA. He will redraft the motion for consideration at the next meeting.

Merry Xmas, good luck with Y2K bug, and 73 from Toodyay, Chris VK6BIK (chrismor@avon.net.au)

THE WIAQ
COUNCIL
WISHES A
MERRY
CHRISTMAS
AND A
HAPPY NEW YEAR
TO ALL MEMBERS,
AMATEURS,
AND THEIR
FAMILIES.



VK6 Notes - Dec'99

The December issue of AR comes out at a time when many hardworking hams can at last take a decent break from the salt mine - hopefully to spend much more time being active on air, putting up new antennas, building things or what have you.

A Carol to sing round the Xmas tree

by Bob Harper VK4KNH

The Twelve Days of DXmas

On the first day of Christmas
My true love gave to me...
A dipole strung up in a gum tree.
Etc Etc until...
On the twelfth day of Christmas
My true love gave to me...
Twelve metres of coax
Eleven QSL Cards
Ten Tiny FETs
Nine Numbered Knobs
Eight Glowing Valves
Seven Insulators
Six Metre Beam
Five Morse Code Keys
Four Microphones
Three Headsets
Two rubber duckies
And a dipole strung up in a gum tree.

Merry Christmas
and a
Happy New Year
to all members
and
their families
from the
South Australian
Division of
the WIA.



Merry Christmas
and a
Happy New Year
to all members
and
their families
from the
West Australian
Division of
the WIA.

VK7 Notes

QRM — The Tasmanian notes

Ron Churcher VK7RN

The writer has just come back from three and a half weeks in Queensland and NSW so I am relying on my ever faithful Secretary and our north-west President Bob for this month's information.

TASMANIAN AMATEURS DO IT AGAIN

Overcoming tremendous odds to deliver the goods! I'm referring to our involvement with communications for the Tasmanian Classic Car Challenge held on the Northwest coast over the October 30th November 1st long weekend. The weather didn't like us one bit - snow, sleet, howling winds, rain — we got the lot and much of the Challenge was in the mountains. The official SES communications channels were practically non-existent at some stages but excellent cooperation between them and our communications system worked wonders thanks to David VK7C and Tony VK7AX. The last straw for some of the officials was when the mobile phone system collapsed west of Wynyard. Amateur Radio to the rescue again with Malcolm, VK7CA travelling with the CAMS officials for the last 2 days achieving what they thought impossible! Even our repeater was showing some problems in the high wind and snow.

All the operators who assisted in the event must be congratulated on their efforts and

the CAMS officials and the rally organiser sincerely thanked all our amateurs.

Special mention must be made of the efforts of Mike VK7ME, Kevin VK7HKN and Gavin VK7HGO for their persistence and skills in managing the Hellyer Gorge stage in some of the worst conditions.

Andrew, VK7XR manned the base control for two days with VK7ZMR, VK7AY, VK7HKN, VK7KC, VK7NGC, VK7KH, VK7BY, VK7ME, VK7KT, VK7PU and VK7MD in the field plus two - VK7HGO and VK7DG who made the special effort to travel from Hobart to assist.

The next items to come up will be the branch Christmas festivities but they are something for our next report.

Cheers for now,

And a very Merry Christmas to one and all,

Ron VK7RN, VK7 State President.

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To all Amateurs
and
their families

Merry Christmas
and a
Happy New Year

from the
Tasmanian Division
of the WIA.



An Inconspicuous Antenna

**Tom Walker VK4BTW
IARUMS VK4 Coordinator
13 Bothwell Street,
Toowoomba QLD 4350**

The article Low Profile Amateur Radio in Novice Notes of April 1999 AR was of considerable interest to Col VK4AKX and myself

Although he would be the last to acknowledge it Col is possibly the most effective observer that we have in the Intruder Watch Service despite operating under difficulties of both health and location. Col is located in Holland Park Brisbane.

Being another of those amateurs who prefer to keep a low profile Col has developed and is using to good effect the antenna shown in Fig 1 as the AKX Special.

With an overall height of 12 feet it only just escapes use as a clothesline. With the 7/22 bare copper wire tarnished to a light brown it is not very visible among the trees in the back yard.

Using an FT77 transceiver with 80 watts output into this antenna the following QSO's have been achieved on CW :- 14 MHz - K0RDW 549, CT1BIX 559, VE6KBS 549, 10.1 MHz - SM1TDE 539, LU5WW 559, XE1FGB 559, XE1NP2AQ 559, HB9US 449, 7 MHz - K5CA 559, VE1ZZ 559, HL4CJ 579, W8VLN 549, JA4MWZ 579, JA3PST 579.

In his regular attendance on the 3.578

MHz Intruder Watch Net on Friday afternoons using this transceiver on SSB at 12 Watts Col's signal to me in Toowoomba is usually 59+ improving as the evening closes in.

If your antenna farm needs only to be a farmlet the AKX Special would be well worth considering.

Technical Editor's Note.

L1, which is described as an ex D/W receiver slug tuned grid coil, may be difficult to duplicate or obtain. Such coils are 35 or more years old. They were wound on 3/4 inch or 20 mm or smaller slug tuned formers. You could try an air wound tapped coil as a substitute. A good starting point would be 10 turns spaced 20mm to 25 mm on a 20 mm (3/4 inch) or 25 mm (1 inch) diameter and then add or subtract turns to suit. The variable capacitor will give some adjustment range. The aim is to achieve a result that will not produce too great an SWR for the transceiver.

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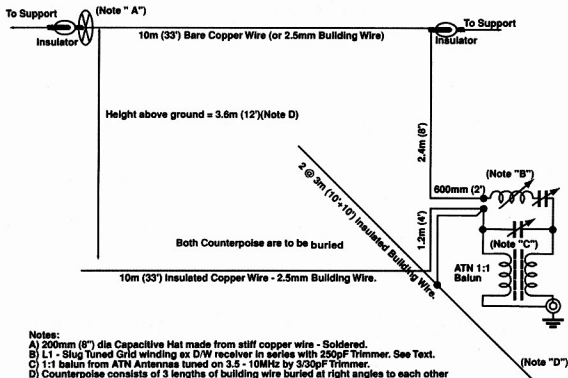


Fig 1. - An Inconspicuous Antenna.

Fig 1 The AKX Special an Inconspicuous Antenna Designed By Col VK4AKX.

CLUB NEWS

News from the Moorabbin and District Radio Club

MDRC promotes AR at hobby show

Amateur radio was on display at the inaugural St Kilda Hobby show held on the weekend of November 6 and 7. The stall, run by members and friends of the MDRC, included activity from club station VK3APC on HF, VHF and UHF. The venue was the Army Hall in Chapel Street, St Kilda.

Our display included various pieces of working amateur radio equipment. Homebrew items also featured prominently with HF receivers, ATUs, power supplied and more being on the table. A large banner we made for this and future shows graced the wall behind the table.

The hobby show was a first event, and the poor weather didn't help attendance, which was somewhat less than expected. However we still managed to re-sign one former member and expose dozens of people to amateur radio. Several visitors also took PR brochures that we had prepared for the event.

Those manning the stall included Keith VK3JNB, Tony VK3JED, Mal (SWL), Craig (SWL) and Peter VK3YE. MDRC members who visited included Tony VK3CAT, Darryl VK3HEM and Chris VK3JEG.

Several other amateurs visiting the show also introduced themselves to us.

One highlight was contacts via the Sunsat satellite by Tony VK3JED. These had to be made outside due to the hall's corrugated iron roof.

HF wasn't much good to start with, but got better as the day progressed. Our ten watts to an end-fed half wave wire on a squid pole provided excellent reports throughout south-east Australia on 40 metres.

However the extreme level of RF noise on all HF and VHF bands made it difficult to hear everyone who called us.

The MDRC thanks those who made contact with us or paid us a visit. The Club has been invited to attend the next Hobby Show, which is planned for next February.

MDRC Monday net continues

Just a reminder that the MDRC's weekly 80 metre net went into recess last month with the introduction of Daylight Saving Time. However the 2 metre net continues each Monday (except the first Monday of the month) on 146.550 MHz at 7:30pm local. This net is a great opportunity to hear what your fellow club members are up to and collect some contacts for the Moorabbin Award.

Publicity brochures now available

As part of the preparations for the Moorabbin and District Radio Club's stall at the St Kilda Hobby Show, the MDRC produced two brochures to hand to interested visitors. The first brochure explains what amateur radio is all about, and is thus suitable to give to the complete newcomer. The second focuses on the services and activities of the MDRC, but could easily be customised to suit your club. Both brochures are A4 size, and thus can easily be copied. Electronic copies of them both (in Word 6.0 format) can be obtained by e-mailing the MDRC Publicity Officer. The address is parkerp@alphalink.com.au. That's parkerp@alphalink.com.au for AR PR leaflets.

The year that was

By the time you read this, we will be near the end of 1999, the MDRC's fiftieth year of existence. It is time to reflect on past achievements and consider new ideas to create a better future for the Club and amateur radio generally.

1999 was a year of innovation and new projects for the MDRC. The club-sponsored Radio on Rails Fun Days promoted rail mobile amateur radio and increased local VHF/UHF activity. In January the Club launched APC News, a high-quality weekly amateur radio news program for Melbourne amateurs. May saw a boost for homebrewing at the 'Even

Greater Crystal Set Competition' held in conjunction with the Club's Hamfest, attendance at which set new records.

Raising club membership and attracting newcomers to amateur radio was a key MDRC activity this year. In September we wrote to 300 non-member amateurs who lived near the Club, inviting them to enjoy the benefits of membership. The mail-out resulted in many new and former members re-joining the Club. November saw the running of a stall at the inaugural St Kilda Hobby Show to demonstrate amateur radio to the general public. We hope that this and future projects will increase amateur activity and further strengthen the MDRC.

Regular activities at the MDRC continued throughout the year. Our club rooms remained well-used with the Tuesday morning and evening activities and the Friday social and general meetings. The Club callsign continues to be used on the Monday nets and has featured prominently in the results of major Australian contests.

So what's in store for next year? The future is what we make it. Let's work to build on the achievements of 1999 and make 2000 another vintage year for the MDRC!

The Committee of the MDRC wishes members and friends a merry Christmas and a safe and prosperous new year.

Peter Parker VK3YE

Publicity Officer

Moorabbin & District Radio Club

parkerp@alphalink.com.au

(03) 9569 6751

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Sumerland Hamfest.

The photo shows Martin Davis, VK4HMD representing Michael's Electronics presenting the ICOM Q7A Handheld to Mr. Eric Baker for Mr Jim Fraser.

EDUCATION

Brenda M Edmonds, VK3KT
PO Box 445, BLACKBURN 3130

WICEN on standby for Summer emergencies

Seasonal greetings and all good wishes for the year 2000 to all readers.

We are looking forward to a number of interesting developments in the forthcoming year, but in most respects the new-year will differ very little from the usual.

In the southern states especially, we are coming up to a time of high fire risk, and it is likely that the services of WICEN (Wireless Institute Civil Emergency Network) will be called upon to assist with emergency management situations.

Newer members may not be well acquainted with WICEN activities, and older members may not be aware of the changes that have taken place within the organisation.

For many members, the best contribution they can make is to ensure that they do not interfere with any emergency traffic which WICEN may be passing, that they stay clear of frequencies or repeaters which may be in use or that they vacate active frequencies if requested.

WICEN began as a loosely knit group of amateurs who put their abilities, time and equipment at the service of the authorities during emergencies such as bushfires. They practised their skills at events such as charity runs, bike rides, Murray River canoe marathons and car rallies, but in a major emergency many amateurs volunteered to provide and man stations without any previous experience of such operation.

In recent years however, WICEN along with other volunteer services has been

formalised and structured. It is now required to carry out formal training for its operators, and to conform to Occupational Health and Safety guidelines. Members must be registered, and must complete training activities regularly. This does not mean the end of the off-the-cuff volunteer — these can be registered as casual workers for a call-out — but it does reduce the pool from which trained operators can be drawn.

This is not necessarily a bad thing. It is much easier and more effective to manage a small, trained, aware group than a larger number of inexperienced, uncoordinated volunteers who have to learn procedures and skills under pressure.

However, depending on the extent of the emergency, it may be necessary to accept volunteers from the amateur ranks to supplement the registered WICEN operators. Let us hope that the situation does not arise, but WICEN is always willing to register and train more members.

ar



**Your bands
Your representation**



Christine Taylor VK5CTY
ALARA Publicity Officer

16 Fairmont Avenue, Black Forest SA 5035
 Packet: VK5CTY@VK5TTY

A Historical Item of Interest

This information came to Dot VK2DB via Warren WB6TMY who, with his wife Barbara, visited Dot and JohnVK2ZOI recently. We are assured that it is true, and that Dick W6AWO (who is known to many, we suspect) would be delighted to tell you more.

The Story of the Commemoration of the first Wireless Message

ACCORDING TO the California Historical Radio Society this is the 100th anniversary of radio in America. On August 23, 1899 a wireless transmission was made from Lightship No. 70 off the San Francisco bar to the Cliff House on the beach.

The message was simple: "Sherman is sighted" but history was made. The "Sherman" was bringing US troops home from the Mexican-American war and the city turned out to greet them in grand style.

The event was recreated on August 23

1999 through the good offices of Bart Lee, the CBRs, the Coast Guard and many others. The Coast Guard cutter Point Brower/NMEX stood off the entry to the Golden Gate and transmitted the same message in Morse on 16.907 and 3.387MHz. This in itself was a big event since the Coast Guard abandoned the use of Morse years ago.

Tom Horsfall, WA6OPE and I participated as part of the Maritime Radio Historical Society.

We set up a station consisting of a military AN/GRC-9 on the roof of the San Francisco Maritime Museum. We used the antenna we have just erected that is destined to work with the restored Radiomarine 4U radio console from a WWII Victory ship that will be part of a permanent exhibit on maritime communications at the museum.

We heard NMEX tuning up about an hour before the event. They were putting in a great honking signal so we knew we were in business. At 11:50 on the dot they sent "Sherman is sighted" on 16MHz and then again on 3MHz. But this time the op on board used his bug at the end of the message to send "ZUT CW forever"! A great, unexpected touch.

Now it was our turn. We came up on 3.540MHz and sent a message of welcome and acknowledged as a QST. Taking the lead of NMEX I also signed off with "CW forever". Unexpectedly, NMEX acknowledged the message cross-band! Not wishing to tempt fate or the FCC I simply acknowledged that with the radio-man's traditional "dit dit". It was a good day and great fun for all. Dick"RD" Dick Dillman, W6AWO

Chief Operator at K6KPH the Maritime Radio Historical society Collector of Heavy Metal: Harleys, Willys and Radios Over 100lb."

Has this been your experience?

Have you ever run a Special Event Station or a JOTA station and called and called and called and had nobody respond? Have you sat there for hours fulfilling your obligations and had nobody respond? Have you listened around and heard other people operating or calling CQ but still had no response to your call? Most of us have had this happen some time. Isn't it frustrating?

Why don't people answer you when they hear you? Is it that they are wary or scared of talking to strangers? Is it that they think they will be bored by a whole lot of information they don't want about the purpose of the special event, or by having to talk to a whole lot of Scouts or Guides? Is it that they don't collect or want to send out QSL cards? Or is it that they have just can't be bothered?

Next time you hear someone operating a Special Event Station, please, answer them. They will be so delighted, and you will be well rewarded for your efforts. You do not need to be bothered about QSL cards unless you want to. You just might find it interesting to hear the story behind the station (like the story up above, for instance). Next time someone is calling for JOTA, please answer them, please spend a little time talking to the children - after all, one of them might be a budding amateur, inspired by their experience at JOTA. It really won't take much time, but it will give a lot of pleasure.

ALARA and JOTA this year

Our involvement this year was less than usual because of the Brisbane gathering but we were still involved. Mary VK5AMD had her Bordertown Brownies, Dot VK2DB ran a station for the Hornsby Scouts and Meg VK5YG helped out with the Murray Bridge group for whom Colin VK5JP runs a preliminary practice session each year.

June VK4SJ has run a station for the Mundingburra Guides but was uncertain whether she would be doing it this year in her new shack - the children had not always been as well behaved as the presence of delicate equipment requires, in previous years. To avoid this sort of problem Bev

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VK6DE uses a roster system so that only one or two Guides are in the shack at a time. The others have other activities to keep them busy.

For the YLs I spoke to in Brisbane I gained the impression that there had been some less than pleasant experiences with running stations for JOTA, both in the home shack and when using the equipment in Scout Halls. This is possibly something that should be addressed by the JOTA organisers and by local leaders.

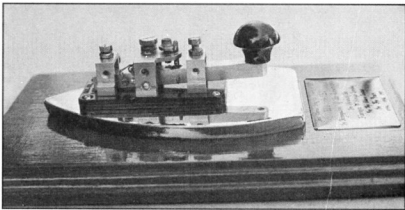
In VK5 the Guide participation in JOTA this year was very low because of a large Information Technology Camp run during the school holidays, immediately before the date of the world-wide JOTA weekend! In other years the Guides have been extremely active.

Marilyn has done it again

Marilyn VK3DMS has won another large Vermeil medal with her "Radiomania" stamp collection. She was a little disappointed not to win gold this time but pleased that she gained another point above her previous score. Maybe next time!

It would have been particularly fitting if Marilyn had won this year as the "Stapex" Exhibition and competition was held on the weekend of her Ruby Wedding. Marilyn and OM Geoff VK3ACZ celebrated the wedding anniversary with a group of VK5 friends on the actual day though they had also been 'well-wished' at the Stampex Gala Dinner the evening before.

Congratulations to you both from your ALARA friends!



The Florence McKenzie Trophy: no wrinkles

Presented to Bev at the ALARAMEET, The Florence McKenzie Trophy is a mounted, working, solid 1930/40 Morse key, such as is used by many keen operators. It came from the collection of Harro VK5HK and is mounted on the base from an electric iron. Although this may seem somewhat chauvinistic in this day and age, it is a very practical idea and makes a really solid-feeling key.

THE WHOLE assembly was taken apart, the base chrome plated and the key cleaned within an inch of its life before reassembly. Geoff VK5NDZ kindly provided ALARA with a beautiful piece of Australian cedar on which to mount the key. There is no new Australian cedar available because all the cedar trees were cut down in the early days so this block is very special.

The presentation was a complete surprise to Bev but we are sure the key will be put to use rather than sit on a shelf. Bev was taught Morse by her OM Graham VK3BGC, a war-taught operator, and is used by both of them in contests and just for pleasure.

ALARA certainly hopes there will be other winners of the Morse section of its Contest (for which the Florence McKenzie Trophy is awarded), including the 1999 Contest just past; but Bev's achievement cannot be surpassed. The rules of the Contest have been changed, now to allow all YL operators to compete for the Trophy. When Bev won it only Novice operators were allowed to enter that section.

With all the moves to remove or, at least to reduce the Morse requirements from the amateur licence conditions, those who use and enjoy CW deserve to be encouraged.

Congratulations Bev!

ar

As a final note for the last column of 1999:

Season's Greetings to everyone

The YL in the accompanying cartoon says it all. (Note the time!). The artist is Sally VK4SHE. Thanks very much.

Happy Christmas. May the DXBE 5 By 9+

SEE YOU ALL IN THE NEW CENTURY





The end of an **Amateur Radio era!**

**Bill Rice VK3ABP
ends record breaking
stint as editor of the
WIA's journal**

Bill Rice, who has served as editor of *Amateur Radio* since 1984, is retiring with effect from this December 1999 issue of the magazine. Bill says the year 2000 seemed to him to be an auspicious occasion to leave, after setting a new record for length of time in the Editorial chair of 15 years and seven months.

BILL WAS BORN IN 1927, almost a Victorian. The Mallee town of Pinnaroo SA is only 8 km over the border from Victoria. Bill spent his first 12 years on the family farm but, Mallee farming being what it was (and still is!), the family left the farm and moved to Murray Bridge in 1940. After stints at Murray Bridge and Adelaide High Schools, Bill eventually became an electrical engineering student at Adelaide University, having been fortunate to pick up a scholarship along the way.

Bill also picked up an Amateur licence in 1947.

He graduated with honours in 1952

having spent the previous three years on RAAF sponsored antenna research.

In 1953 Bill moved to Melbourne to work for the RAAF as a civilian "boffin" with the Aircraft Research and Development Unit at Laverton.

He and Margaret were married in 1953, and he continued at ARDU until 1976 when the unit moved to Edinburgh RAAF Base north of Adelaide. Bill elected to remain in Melbourne and moved to the Aeronautical Research Labs at Fisherman's Bend. He retired in 1987 after 34 years with the Defence Department.

After retiring from full time employment,

Bill had more time to concentrate on editing *Amateur Radio* magazine, a task he had taken on in 1984 after 12 years as a member of the Publications Committee as Senior Technical Editor.

With his encyclopaedic general knowledge, and outstanding electronics knowledge, Bill has taken great pride in being at the helm of a hobbyist technical magazine which has published a lower number than average of technical and other errors.

Bill is rather hopeful that he will now be able to devote much more of his time to the practice of *Amateur Radio* as distinct from its journalism.

On behalf of the Federal Council, the Executive and all WIA members, thank you Bill for your outstanding service over a very long time to your fellow amateurs.

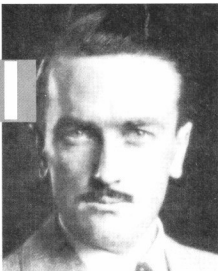
Peter Naish VK2BPN

Federal President.

ar

THE GREAT Ross Hull

by Eric Jamieson VK5LP



ROSS HULL is best known for his pioneering work in the field of development of the VHF and UHF spectrum, in particular equipment for the 56 MHz amateur band and later for the 112 and 224 MHz amateur bands. These were the bands offered to the amateurs during the period between World War I and World War II. Initially they were shunned by the professionals due to their perceived "line-of-sight" limitations.

ALTHOUGH MUCH of Ross's developmental work took place in the USA, he was an Australian, born in Melbourne in 1902. Although he was trained to be an architect, early in his life he developed a great interest for radio, amateur radio in particular and operated with the call sign of OA3JU. By 1922 he had progressed to become one of Australia's best achieving amateurs, being the first to receive signals from amateurs in the US.

He firmly believed in the Wireless Institute of Australia and became its Federal Vice-President in 1924. Later he was appointed Secretary.

In 1925 the Victorian Division of the WIA formed a committee to undertake tests to establish contacts with ARRL stations in the USA. The Committee consisted of Howard Kingsley-Love 3BM, Ross A Hull 3JU, WFM Howden 3BQ, EK Cox 3BD and C Philpott. The VK prefix was to be added to their call signs later. (1)

On 25 July 1925 Australia was visited by the US Naval Fleet which called at Melbourne. The vessels included the Flagship *Seattle* with station NRRL aboard manned by Lt Fred H Schnell, USNRF, and IMO - 1XW was greeted as the first ARRL contact by Ross A Hull A3JU and H Kingsley-Love A3BM and others. The latter was Editor and the former Associate Editor of *Experimental Radio and Broadcast News*. (1)

The US recognises his value

As the result of meeting Fred Schnell, Ross was determined to see America so in 1926 in his capacity as Secretary of the WIA he visited the United States to study American radio activity, particularly amateur radio.

The ARRL was quick to recognise his potential and appointed him to a junior position in the editorial department, the technical information service. He extended his stay in the US and was eventually appointed to the position of Assistant Technical Editor of *QST*. (2)

When, in 1928, the Board of Directors authorised a special technical development program at ARRL HQ to devise new apparatus and methods, to meet the trying conditions that would confront amateur

radio in 1929 when the Washington Convention took effect, Hull was the logical man to head the program and became its director. The brilliant success of that program is a matter well known to every old time amateur. Much new gear of Hull's devising was introduced and it is not going too far to say that his studies over that period revolutionised our technique. (2)

He popularised "band-spread" for amateur receivers and was responsible for the first serious use of the superheterodyne

The Ross Hull Memorial VHF/UHF Contest

The annual Ross Hull Memorial VHF/UHF Contest commences on 26

December (see page 40) This year's contest has special significance in that it is the 50th such contest to be held. It is the Golden Anniversary Contest.

Therefore, it seems appropriate that this article accompany the commencement of the Golden

Anniversary Contest. The list of each year's winner is included in *VHF/UHF - An Expanding World* in this issue.

While the name Ross Hull is familiar to many amateurs, those new to the ranks may well ask who is/was Ross Hull? In the January 1998 issue of *Amateur Radio*, when promoting the contest, John Martin VK3KWA wrote an excellent article about some of the achievements of this radio pioneer. Again, because there are newcomers who may not have read John's article, so with his permission and that of *Amateur Radio*, it is proposed to re-

present some of his points together with additional information that may be new to most people.

I am greatly indebted to Mark Wilson K1RO, Editor of *QST*, *QST* magazine and the ARRL, for the provision of scanned copies of *QST* on CDs from the 1930s together with photographs which have provided much sought after background information regarding Ross Hull and the work in which he was involved. This kind of co-operation across national borders helps to keep alive one's faith in amateur radio in particular and mankind in general.

Thank you gentlemen.

Of necessity when preparing an article such as this, one is forced to draw on archived material, for the simple reason that so many of the events occurred before I began to take an interest in radio. In fact, Ross Hull died in the same year that I began to write SWL notes for *The Adelaide Advertiser* - 1938. Therefore, there are frequent references to material supplied by *QST* and John Martin's article of 1998.

Eric Jamieson

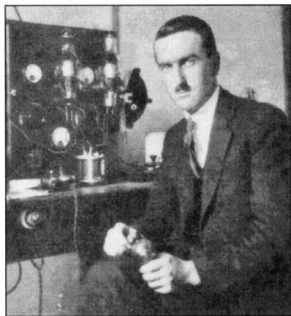


Photo 1. Australian 3JU - at his station in Melbourne, about 1924. *QST* 11/38.

in amateur circles as the logical receiver for phone stations. He produced the first practical apparatus employing the high-C circuit for self-excited oscillators, made the first presentations in amateur radio of 100%-modulation and the use of linear RF amplifiers, first introduced the signal monitor. This technical-development program was the beginning of real development work in the ARRL Headquarters laboratory and shop, thereafter carried on almost entirely under his direction. (2)

He himself had a flair for building unorthodox equipment. He popularised the practice of putting tubes upside down or at unusual angles to shorten leads and was largely responsible for the abandonment of bread-board construction in favour of bent metal chassis. The apparatus he built, although often put together under stress of time, was beautifully constructed, mechanically rigid, and with losses minimised to work at the greatest efficiency, whatever its purpose. He set the pace in apparatus design for many years. (2)

He returned to Australia in 1929 and became the technical editor of *Wireless Weekly*, which was edited by his brother, A Galbraith Hull. *Wireless Weekly* was the fore-runner of today's *Electronics Australia*.

Ross joins the staff of *QST*

But he had been well and truly bitten by the American bug so he returned to the US and

in January 1931 he joined Kenneth B Warner WIEH (Secretary of the ARRL, Editor-in-Chief and Business Manager of *QST*) as Associate Editor of *QST*, a position from which he became the mainspring of the *QST* editorial staff. Ross Hull had the ability to organise and direct; he could keep his eye on the ball and inspire others to do the same; and at the same time he worked like three ordinary men in the laboratory himself. Here he developed new equipment for use by WIAL, the ARRL's own experimental station. Much of the equipment was

designed to work in the UHF spectrum, which in those days was considered that portion above 30 MHz, with particular emphasis on the 56-60 MHz (five metres) amateur band. (2)

Typical five-metre equipment of the day, was a modulated oscillator using a single valve which was quite unstable and could produce almost as much FM as AM as they drifted across the band. Hull recognised the shortcomings of this form of transmitter and the accompanying super-regenerative receiver that radiated spurious signals to interfere with others on the band or surrounding services. He worked to improve frequency stability and reduce operating bandwidths. If transmitters could be made more stable then receiver bandwidths could be reduced. The benefits would be less interference and a better chance to hear distant stations. Thus came his designs for separate oscillator and amplifier stages to reduce frequency pulling and FM and also receivers with improved selectivity. (4)

Improvements for five metres

The first step in this direction was when for that band he pioneered relatively simple apparatus using ordinary receiving valves. That they worked so well was testimony to his skills in achieving efficiencies never intended for such devices. A sample of his design work is shown in the transmitter, modulator and receiver circuits in ref. (4), where those ordinary radio valves were

used on 56 MHz to provide contacts over considerable distances. The transmitter follows the principle of separate oscillator and amplifier, the receiver had a tuned RF stage ahead of the super-regenerative detector. This was quite a step forward in the design of equipment, simple as it remained. By now his efforts in this direction showed amateurs the great enjoyment which could be had from five metre contacts.

In the early 1930s the average five-metre station was capable of working about 15 miles. But in August 1934 Ross amazed his colleagues at *QST* by announcing that he had worked from Hartford to Boston, a distance of 100 miles. His secret was the antenna. At the time everyone used vertical antennas, but Ross put up a beam. It was a simple antenna by today's standards - four quarter-wave radiators fed in phase with four reflectors - but it made a startling difference to station performance. (6) The word spread and before long the distance records were tumbling.

Then Ross made a big discovery. He had observed that signal strengths varied over time; a signal could be strong today and gone tomorrow - or it could be present in the morning but absent in the afternoon. To find the answer he now turned his attention to a detailed study of VHF propagation.

Propagation studies

He did a long-term piece of original research work of great value in recording received UHF signals and correlating their transmission with weather observations, establishing for the first time the true cause for the bending of these waves in the lower atmosphere. For Hull, by means of high gain antennas, was regularly communicating on five metres over distances in excess of a hundred miles, when others were still labouring to exceed fifteen miles except on the occasions when they talked to Hull. (2,11)

Over a period of several years he made regular recordings of distant UHF signals, accumulating a vast quantity of data which required prodigious labour to correlate and analyse. He delivered several scientific papers on this work before technical societies. (2)

For this work, in March 1935 he built the equivalent of a chart recorder. (7,11) He fed the output of a receiver to a meter, and focussed the image of the meter needle through a slit on to a strip of photographic film. The film was drawn slowly past the slit by a gramophone motor. This enabled him to correlate signal strength with other data, and it became clear that signal variations were associated with changes in atmospheric pressure and moisture. This led

to the discovery that VHF signals are refracted in the lower atmosphere, in much the same way as light rays.

Record distances increased

This was a major scientific discovery, on a par with the discovery of ionospheric reflection on HF frequencies. But it was made by an amateur with no scientific training, using home-made equipment. (11)

Ross published his findings in *QST* (8,9), and they led to a flurry of experimental activity and another dramatic increase in VHF record distances. Within a short time, five metre contacts were being made half way across the country - a far cry from just a couple of years before, when even the most die-hard experimenters thought that VHF would never be useful for anything other than chatting across town.

Ross applied the same techniques of stable oscillators and beam antennas to the 112 and 224 MHz bands. As early as 1934 he had succeeded in working over 75 miles on 224 MHz. (10) As more amateurs adopted his techniques, it was not long before the 112 and 224 MHz bands started to deliver the same kind of DX that had been achieved at 56 MHz. (11)

Ross was also the editor of *The Radio Amateur's Handbook*. He joined Communications Manager Handy in the rewriting of the fourth edition. Shortly, of course, it became a family affair; the product of the entire staff, and all successive editions were under his editorship. (2)

The tragic end of a life

[The following comes direct from and is part of the Obituary to Ross Hull contained in ref(2).]

Ross Hull was also greatly interested in television, particularly in the ultimate opportunities for its employment in amateur radio. He had an elaborate experimental setup of his own devising at his home on a Connecticut hilltop, a thousand feet above sea level. With his remarkable ability to scoop up UHF signals, he was succeeding, in his last few weeks, in receiving the NBC experimental transmissions from New York, a hundred miles distant, about as well as they were received in New York City, much to the amazement of the NBC engineers.

He had, in fact, built an experimental amateur television transmitter in the ARRL laboratory which was sufficiently promising to indicate that amateurs may soon expect low cost two-way television communication without the need for precise standardisation on number of lines and so on.

It was the power supply for his television receiver which caused his death. This receiver required a 6,000 volt plate supply for its large Kinescope. While only a few milliamperes were required, small transformers had caused trouble through surface leakage and he had replaced them by a husky 1.5 kw 4,400 volt pole transformer. The power supply was on a shelf under the table, and the mains outlet was on the wall behind and immediately above this apparatus. It was a dangerous setup. While wearing phones connected to the converter and receiver, and grounded on one side, he reached over the power supply to plug into the 120 volts mains. Upon withdrawing his hand he came in contact with the high-tension lead to the rectifier plate, pulled it off, and fell so that the 4,400 volt lead was contacting his body, the phones providing the ground.

He had as a dinner guest that evening a doctor who was an x-ray expert and familiar with high voltages. Sensing trouble from the next room within thirty seconds after Hull plugged in the power supply, the doctor ran to his aid, dragged him clear and applied artificial respiration.

Two other doctors arrived in a short time, adrenalin was administered, a pulmotor was quickly got, and every effort was promptly made by experts. But to no avail: death had been instantaneous on 13 September 1938.

There is an awful lesson in Ross Hull's tragic end. He did not need to die. If the small transformer had still been in use instead of the brute with a powerhouse behind it . . . if the power supply had been covered . . . if the plug had been somewhere else . . . if the line had been lightly fused . . . if he had not had on the headphones. . .

Hull was himself the author of the warning against high voltages which appears in the *ARRL Handbook*. But skilful experimenters are too often

contemptuous of the dangers in which they work. Far too many amateur transmitters are potential lethal machines. When death comes to as clever and versatile experimenter as Ross Hull, it must be a painful object lesson to the rest of us.

Of the most endearing personal qualities, Ross Hull leaves aching hearts in all who knew him. He was a grand guy. He will live forever in the thoughts of his friends.

His other interests

The story of Ross Hull does not end there. He had many other fine qualities and these should be mentioned. Kenneth Warner W1EH, Editor-in-Chief of *QST* writes as part of *It Seems to Us* (2):

The electrocution of Ross Hull tragically closed the life of the man whom we consider the most brilliant and ingenious and indefatigable amateur we have ever known. Possessed of a restless, inquiring mind, a determination to out-do all others in everything he attempted, and never satisfied with the accomplishments either of himself or of others, Ross Hull poured unbelievable numbers of hours and an

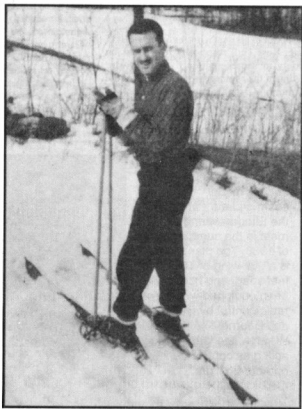


Photo 2. An Enthusiastic Skier - of considerable ability; Hull made frequent weekend pilgrimages to the hills of upper New England. Snapped in New Hampshire in 1937. *QST* 11/38.

astounding enthusiasm into numberless projects, both in and out of amateur radio.

Most of our readers know him as a radio amateur who left a deep impress upon our field but, although amateur radio was his greatest love, he was proficient in many fields. He was a brilliant pianist, with a great love of music, and played for hours every day. He was an artist of considerable ability in oils, water colours and crayon. He was an expert amateur photographer, both as a pictorialist and in scientific work, and many of *QST*'s cover illustrations have been his work. He was interested in astronomy and had built several reflecting telescopes.

Model aircraft was one of his passions from childhood. The last several years, he and W1ANA had been building model soaring planes of considerable span, large enough to carry radio apparatus for control in flight. With it all, Hull found time to read everything and the time to play; skiing in the winter, golf in the summer. With his radio gear, his piano, his cameras and his workshop he lived the life of the ideal amateur at his cottage in the Connecticut countryside. He was unmarried.

The need for safety measures

Just prior to his death, in an ironical twist of fate, Ross Hull responded to a letter on safety measures written by Mr Howard Chinn of the engineering department of the Columbia Broadcasting System, in the following manner:

Dear Howard: Of course you are quite right about the insane fashion in which

amateurs operate high-voltage equipment and about the equally stupid fashion in which we even go to the trouble of providing photographic illustrations of just how to do it. I would explain (not that it helps any) that the W1AW transmitters were, when the photograph was taken, still in the laboratory undergoing final checking. Since then, the transmitters have been fitted with elaborate "dust covers" and illuminated signs. There will also be much more space between the back of the transmitters and the wall and I understand appropriate cushions are to be placed along the wall and behind each of the units.

Seriously Howard, we should take some steps to keep amateurs impressed with the dangers involved and possibly insist on some protective devices, and I think we shall come to that. We have of course run quite a lot of material on the general subject - including a problem contest for ideas on the subject - but we should do more. Aren't you impressed though, with the better performance in the amateur world than in the professional world, particularly when one thinks of the relationship between the high-voltage-hours involved in the ham game? The most important problem is that amateurs seem to insist on the right to tune their transmitters with a lead pencil. They will not use a complete enclosure with interlock. And any of the other "safety" devices are probably worse than nothing.

How about writing a story for *QST* on ways and means?

Sincerely yours,
Ross A Hull, Editor, *QST*.

Conclusion

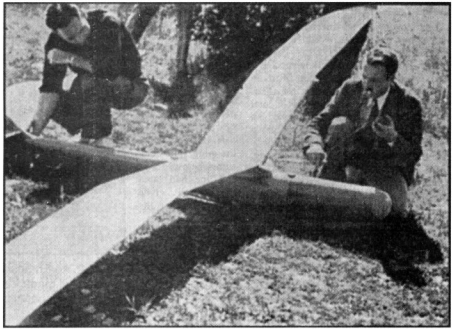
10) Had Ross lived a normal life span one wonders to what extent the amateur radio movement would have benefited from his brilliant mind. Certainly VHF, UHF, SHF and microwaves would have been high on his list. Improvements in these areas coupled with better antennas had to lead to ever increasing distances for contacts.

It was a sad day for the wireless/radio electronics industry when such a great man had his life cut short doing what he loved - amateur radio.

References

- 1) *WIA Book Volume 1.*
- 2) *It Seems to Us, QST* November 1938.
- 3) *Firing Up on the Newly Opened Ultra-High Frequencies, QST* September 1934.
- 4) *New Equipment for the 56 Mc Station, QST* August 1934.
- 5) *A New Receiving System for the Ultra-High Frequencies, QST* November and December 1935.
- 6) *Extending the Range of Ultra High Frequency Amateur Stations, QST* October 1934.
- 7) *A Simple Photographic Recorder for the Experimenter, QST* March 1935.
- 8) *Air-Mass Conditions and the Bending of Ultra High Frequency Waves, QST* June 1935.
- 9) *Air Wave Bending of Ultra High Frequency Waves, QST* May 1937.
- 10) *Progress on the Ultra High Frequencies, QST* January 1935.
- 11) *Ross A Hull VHF Pioneer, Amateur Radio* January 1998.

Photo 3. Hull (right) and his model soaring plane - at the Elmira soaring meet in the summer of 1938. The plane is a gull-wing of 16-foot span, and had been equipped with radio control by Hull and Bourne W1ANA, the latter acting as control operator in flight. *QST* 11/38.



The WIA and its record

October "AR" proposes a 90 year celebration party, to be held during AD 2000, great, I'm all for it even though a long bow will need to be drawn to give authenticity to the claim.

The fact is, the final touches to the WIA, as we know it today did not occur until April 1929. However the WIA can rightly claim that its 'roots' do go back to 1910. This was the year the first recognised Wireless Club was formed in Sydney, Australia. Its members were a mix of academics, PMG engineers, techs and others of a like mind. In fact a few of them had been 'Wireless freaks' since the turn of the century ie. 1900. So by 'stretching the bow' just a little more it's possible to hold one party for two events. Let's do it!

This may be appropriate time to ask, "How well do we know the history of what we plan to celebrate?" Would you be found wanting? Now the cynic may defend his ignorance or lack of interest with, "Does it matter all that much"? Make no error, those who think this latter way will put the WIA on the fast track to oblivion.

You could rightly argue that every AR event worthy of reporting has appeared in some journal, magazine or newsletter somewhere in VK since it all began in 1900. True, but have you ever spent a whole day at some library or university thumbing through endless pages of print material in an effort to find the few items or info?

There is a better way to preserve our history! Interviewing SEQEB's (now ENERGEX) curator I commented on his detailed knowledge of the Power Authority's history. I have never forgotten his reply. "Any group, club, society, authority etc, worthy of its name, keeps a detailed up to date, easily referenced account of its activities and personnel."

Is this where we are at the WIA? Sorry NO! Does the Institute plan to put all past pertinent events and the Hams involved, between the covers of one book or perhaps better still on CD? Are the divisional historians doing any research to this end?

The WIA would never have survived to

hold a 90 year party without its journal "AR" and it's a must that its standard be maintained. Whatever 'future shock' awaits us, so sudden will be the changes come Y2K.

The years AD 2040-50 should see another generation of "amateurs" (?), hopefully in the majority. Many of them will carry the perception that electronics and the global village began with the computer and the Internet, only those few with historical knowledge will know better.

Out of respect to our 'Wireless' forebears, let's set our past history in stone or the modern equivalent. No dull tome is needed, simply a chronological (dated) run down of pertinent events and persons involved, highlighting VK's development from Spark to Internet. To be sure no "selective inattention" creeps in, each divisional historian should research his own state.

It will never be done you say. It's the WIA's choice. Tens of thousands of very

worthy Clubs, Societies etc have come and gone this 20th century simply because insufficient funds were taken to preserve their identity and existence.

The party

All things considered, let's lay it on - big. There'll never be another, 90 years on. Man and the Ham will have become something else by then; part of "Smart Space", whatever that is.

The uniqueness of the event demands the absolute best be made of it, on air and on computer sites, all over VK and beyond. All bands, modes and some 'AM fone'.

If, as we claim, our 'roots' began with the club of 1910, then we are indeed unique. This has been our century. Our forebears gave the world the "Global Village".

Access to the activities of the club of 1910 should be no problem via the NSW State Library, and the member's names could be obtained. The least we can do is to raise a toast (or 3) to those men and women who enabled the WIA to claim to be the second oldest club in the world. The WIA has indeed had a long run.

Just in case I can't attend Party 2000AD, maybe some kind member of the fraternity will offer up this toast on my behalf.

"Here's to WIA members, present and past, and to all others, who in a 1000 different ways, helped advance the state of the art to what we enjoy today. Thanks for the memories, cheers, bottoms up, and LANG MAY YER LUMS REEK."

73 Allan Shawsmith VK4SS

ar

SNIPPITS

During the 1974 Australia Day Floods in Queensland, the main Brisbane water treatment plant was totally cut off from the Brisbane City Council. The only communication that could be established was via Amateur Radio. Dave Hutchins VK4HW and Ron Grandison VK4RG, who worked at the Mount Crosby Water Treatment Plant, and several others at various points in between Mount Crosby and Brisbane, relayed vital river level readings and other information to the Council Engineers in Brisbane. Without their valuable assistance Brisbane may have suffered even higher water levels as these readings formed part of the feedback system controlling the release of flood water from Somerset Dam.

High Sea Antennas

Mark Dowdidge VK4MFX* shares his experience with maritime mobile antennas.

I'm writing this article in reply to "Yacht Antennas" (*Random Radiators*, "Amateur Radio" February 1997) to help clarify and explain the associated problems with marine antennas on timber and fibreglass vessels. Antenna efficiency is based upon R_r and ohmic losses or R_e . Since the length of the antenna or R_r (using the backstay wire), cannot be improved, we can, however, reduce our ground loss. Ground loss can come in many forms, but the construction material of a vessel is not one of them.

Earth straps from the ATU to the earth

plate should be kept short, and if possible not exceeding 1.5 meters. If the distance between the ATU and the main earthing body is too great, secondary radiation from the strap will take place, or the strap will form part of an RF loop circuit and propagate RF energy back into the set, boat, ocean, "household" wiring and whatever else is nearby, including YOU.

Earth straps should also be as large as possible, ie 100 mm copper strap. Do not use copper braid, as used in the automotive industry, as it is prone to electrolysis in the marine environment, quickly corroding and thereby increasing AC resistance or R_e .

Earth plates are "spongy" bronze plates measuring 160 x 60 x 25 mm approximately

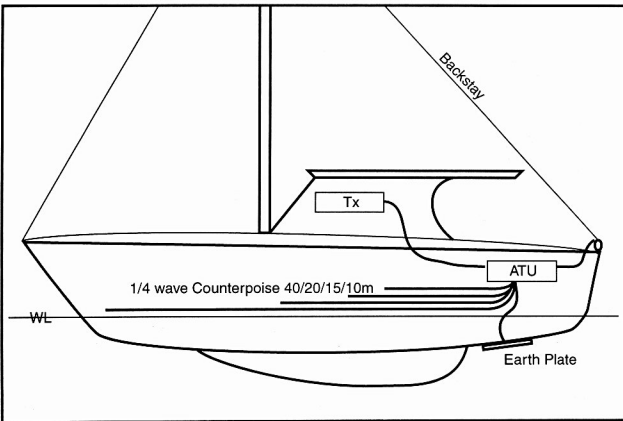
and having an electrical area of about 12 square feet or 1.1 square metres. These are bolted on the outside of the hull and placed in a position which is in constant contact with the ocean under all sea conditions.

The US Coast Guard specifies that any vessel having HF on board must provide an undersea ground of at least 12 square feet or 1.1 square metres of copper. However, it further states that, although earth plates provide a large "spongy" surface area for interface with the sea, the conducting cross section of the water, one thousandths of an inch away from the plate, is still less than a fraction of a square foot; not the 12 square feet required.

A typical yacht has a compounding problem. The earth strap is usually insufficient in width, approximately 2-3 metres in length, which is then connected to only one of the two protruding earth plate bolts, and also the earth plate is electrically too small.

By moving the earth plate further aft, this will shorten the copper strap, but the plate will not be in constant contact with the ocean under all sea conditions.

We haven't yet included a further increase in R_e due to anti-fouling, slime and barnacles, etc. Incidentally, earth plates should not be anti-fouled, but regularly



cleaned and kept shiny. Codan's technical manual recommends an earth strap of 100 mm minimum and no less than two earth plates.

ATUs can also pose a problem in that they can mask the effects of a bad ground. It will match whatever it sees to the transmission line; however, if what it sees is a high loss ground connection, it will match this too, thereby pumping all the energy into a connection that doesn't do much more than warm the ocean.

An example of this was a vessel whose system employed a Codan transmitter and ATU, and one metre of 50 mm copper strap connected to an earth plate. With my SWR meter in place, we tuned in 8 MHz until the green light appeared on the transmitter (indicating the rig was SWRed in), yet, the meter showed an SWR of 10:1. Between different frequencies the SWR varied between 10:1 and 3:1.

The problem was twofold. Firstly, between the ATU and the copper strap was a two inch copper braid section, green with electrolysis. Secondly, the earth bolt on the ATU had worked itself loose inside the set, not providing a good connection. After fixing both problems the SWR fell to 1.2:1.

The above exercise shows a textbook

example of how an ATU can both match and mask bad grounds.

Cruising for the past six years on our 40 foot timber/fibreglass catamaran "Inflight", and being an avid QRPer, I've thrown away the earth plate and now use radials.

This system consists of a quarter wavelength radial per band covering all marine and ham bands, wound on to a four inch plastic spool. This spool is located approximately two feet from the ATU (manual) and three feet above the water line. I've experimented with rolling the radials out, but both VK and DX contacts reported a better signal with it rolled up.

To achieve excellent results you don't need a steel or alloy boat, or even an ATU. Every vessel has different electrical characteristics and each one must be "tuned in"; this can only be done with experimentation, perseverance and a few bits and pieces.

However, next time you "crank up" the rig, try QRP and, as we say in our QRP club, "we do more with less!".

Special thanks to Gavin VK4ZZ

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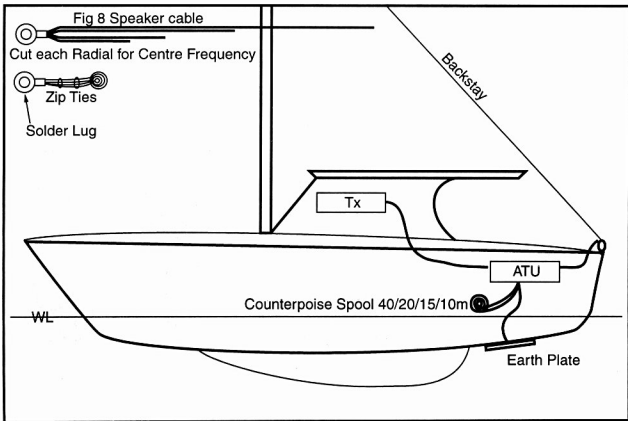
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A Spectrum/Attenuation Measuring Set

Drew Diamond, VK3XU

45 Gatters Road
WONGA PARK 3115

In the interests of spectrum conservation, and to preserve good relations with fellow users, our transmissions should be as clean as can reasonably be made. As far as I know, there are no actual figures placed on the permitted level of unwanted emissions in this country—just a requirement that our transmissions should be reasonably free of defects. In the USA for instance, the FCC requires that for amateur transmitters below 30 MHz, at power levels between 5 and 500 W; spurious outputs must be at least 40 dB below the main signal, which probably represents a reasonable figure to aim for, and can easily be achieved in most instances.

The ideal tool for measuring and displaying transmission characteristics is a spectrum analyser. Fortunately is the radio worker who has access to a laboratory or communications-style instrument, but few of us have that privilege. If you are seriously interested in putting out clean signals (and we should be); then this test set may be just the thing.

Rather than the usual CRT display (where an oscilloscope is required), I have used an ordinary moving coil meter and speaker as indicators. Additional equipment required to make measurements are a 0 - 110 dB switched step attenuator (see Ref. 8), and a signal generator or signal source, such as the Q-1312. The resulting measuring set may be used to test for harmonics and spurs, and derive a real dB figure. The set also finds use in measuring actual values of attenuation and gain.

Performance

Basic sensitivity (for f.s. meter deflection) is -60 dBm (220 microvolts).

Minimum discernible signal on speaker is -110 dBm (0.65 microvolts).

Dynamic measuring range is 40 dB, then another 20 dB on the meter, making 60 dB.

Maximum input signal level is -20 dBm (22 mV), and, perhaps surprisingly,

Response flatness is within ± 2 dB from less than 100 kHz to at least 60 MHz.

The receiver (for that's what it is) draws about 25 mA from a 9 V supply.

Circuit

At first examination, it was thought that an ordinary double-balanced ring-diode mixer would do the job. However, they are rather insensitive, and usually require a local oscillator (L.O.) power of about +6 dBm (4 mW). Furthermore, the outputs obtained from such a mixer, even when the signal level is small, were found to be too many, which causes confusing results. This idea was discarded in favour of the ubiquitous NE(SA)602AN, which does a much better mixing job in this application.

What we have is a simple direct-conversion receiver, with un-tuned input. Signal is applied to one of the inputs at pin

1, which is terminated with a 51 ohm resistor in order to correctly match the external attenuator set. A 1 mW (or thereabouts) L.O. signal from a calibrated signal source (or generator) is applied to the OSC. port at pin 6. When the input signal is within about 10 kHz of the L.O. signal frequency, an audio frequency product is created at the output pins 4 and 5 of the '602, which is passed through a simple RC filter comprised of a 10 k resistor and 3.3 nF capacitor before being applied to the input pins 2 and 3 of the LM386 audio amplifier chip. The RC filter is necessary to attenuate ultrasonic and RF components, and thus prevent overload of the '386 by these unwanted products. In addition, a 10 mH RF choke coil and 2.2 uF capacitor are connected in series across the gain pins 1 and 8 of the '386, which gives the amplifier a very useful broadly-peaked response at around 1 kHz.

The output of the '386 amplifier is applied to a small speaker so that beats and signals may be heard, and also to a voltage-doubler diode detector which produces a dc voltage in proportion to signal strength. The dc signal thus derived is presented to a simple single-FET voltmeter, which drives the 1 mA meter coil. A small-signal silicon diode is connected between gate and negative rail (chassis ground) to prevent damage to the FET in the event of very strong signals being applied. The diode also imparts a very nice quasi-log law to the voltmeter's response, making it possible to obtain over 20 dB of on-scale range.

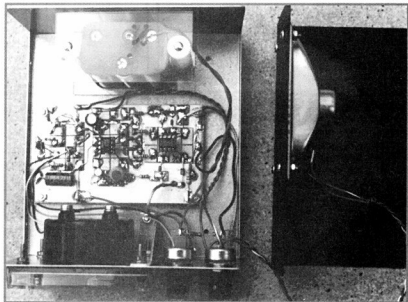


Photo 1. Internal view of the receiver

In operation, the main, or fundamental signal is first tuned-in by adjusting the L.O. to a frequency which differs by about 1 kHz. The external attenuator set is then adjusted to provide an on-scale reading on the meter, typically -60 dBm for 1 mA full-scale (f.s.) deflection. Harmonics and spurs of the main signal are then searched-for by carefully varying the L.O. generator frequency. When a signal is found, sufficient attenuation is removed to bring the meter reading back to that noted for the main signal. Now, the amount of attenuation removed equals the number of dB that the unwanted signal is below the wanted one. A similar measurement is made to find the value of gain or loss for other devices. More later.

Construction

In order to keep extraneous signals out of measurements, the receiver must be accommodated in a metal box or case. The prototype is housed in an off-the-shelf box measuring 150 x 76 x 134 mm which is available from the usual suppliers. Any home-made or other metal case, such as a die-cast box of similar dimensions would be fine. The device operates from six type AA cells providing a nominal 9V supply. The ordinary plastic battery holders of my experience always warp from the constant pressure of the springs, so it is suggested that the battery holder should be sandwiched top and bottom between perspex or other insulating material, with plastic rod spacers between, and fitted upright in a manner similar to that shown in Photo 1.

If the receiver is to function properly to at least 60 MHz, the '602, '386 and associated components must have reasonably short lead connections. One of the quickest and easiest wiring methods (in my opinion) for one-off projects of this kind is to use "paddyboard" or "ugly" style. It is quick, stable, functional, easy to troubleshoot, and allows further work without having to remove the board. Also, if the device ever becomes redundant, the parts can easily be reclaimed and used again. The plain circuit board measures 100 x 60 mm. The wiring job is made less fiddly by accommodating the '602 and '386 chips in wire-wrap sockets soldered upon substrate pad-boards measuring 20 x 30 mm, which in turn are soldered or super-glued to the main board. Take care with the socket pins—they are made (I think) from phosphor-bronze, so they must be gently flared, rather than just bent to fit. Dick Smith experimenter boards fitted with ordinary sockets would also serve. See References 3, 4, 5 and 6 for further information on these, and other techniques.

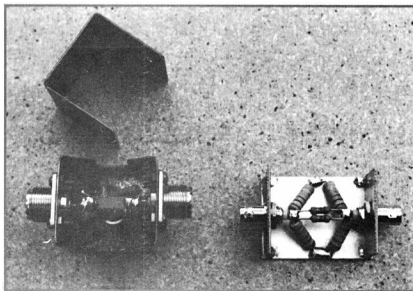


Photo 2. Signal Sampler and 40dB power attenuator

For good resolution, and ease of reading, the 1 mA meter should be a fairly large one. Volume control, balance pot, L.O. connector, signal input connector, on/off switch and LED "on" indicator are fitted upon the front panel. The 2" X 3" oval speaker may be fixed inside the top cover, and lined up with the vent holes. Verify that there are no clashes when the cover is fitted. If you are using a box similar to mine, an additional bracing member is suggested for the front panel.

Use shielded wire, or miniature 50 ohm coax for the L.O. and signal connections between panel and board. Hook-up wire leads to the battery, speaker, volume pot, balance pot and meter are not critical, and may be any reasonable length. Use miniature 1 K lin. pots to conserve space if necessary.

When transmitters or sources greater than 250 mW are being measured, a signal sampler or power attenuator will be required. Shown in Photo 2 is a -40 dB in-line signal sampler for high power (to 100 W), built from brass sheet, and a 40 dB 6 W power attenuator made from double-sided circuit board. One method of constructing circuit board boxes was outlined in Ref. 8. Their use is described below.

Operation

Inspect your circuit board and wiring again, and check that all is correct. Set the balance pot to about mid travel. Connect 9 V battery and switch on. The meter should deflect upwards initially, then drop back near zero. Adjust the pot for zero deflection. A number of 2N5484's were tried in the FET VM

circuit, and all of them could be balanced. However, if you find that the meter will not zero, but all appears correct otherwise—try another 2N5484 or 2N5457. The more common MPF102's have a rather large spread, and may not work in this circuit.

A quick and easy test that the receiver is working can be made by connecting a calibrated signal generator to the L.O. BNC with a 50 ohm coax cable, and a short antenna of about 2 metres of hook-up wire, which is laid upon your bench and connected to the signal input BNC. It should be possible to tune-in all your local BC band radio stations by setting the warmed-up generator exactly onto the station's frequency. It may even be possible to hear some SW stations by tuning the generator to the 9 MHz band. If you have access to a signal generator with calibrated output: confirm that a signal level of about -60 dBm (220 microvolts) when tuned for a 1 kHz (thereabouts) beat-note produces f.s. on the meter. Some salient voltages are shown on the circuit to aid in any troubleshooting.

A typical measuring set-up is depicted in Photo 3, where a 4 W CW QRP transmitter is being checked for spurious emissions and harmonics. The 4 W signal must be reduced to an appropriate level before it is applied to the step attenuator (mine uses 1/4 W resistors, which would burn up at the 4 W level). A 6 W rated 40 dB attenuator pad is shown at the left-hand end of the attenuator set.

The generator's dial is used as if it were part of the receiver. Initially, the generator (our L.O.) is set to within about 1 kHz either side of the transmitter's frequency. Basic

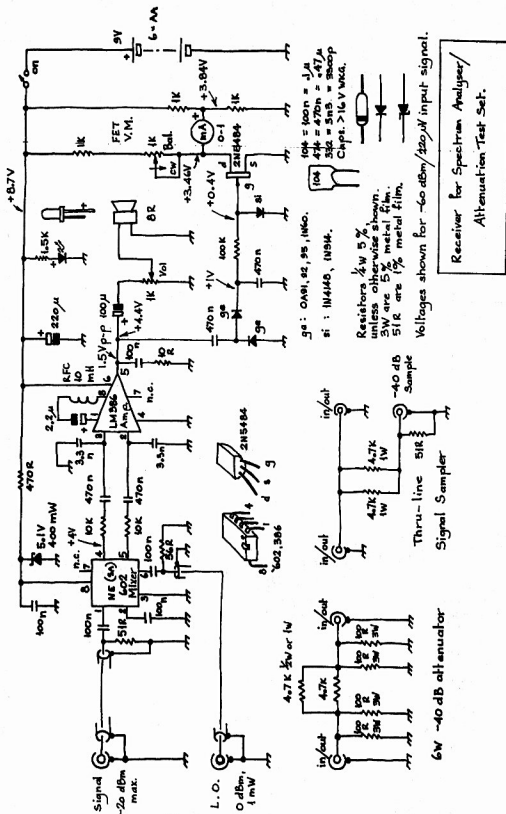


Figure 1. Receiver for Spectrum Analyser/Attenuation Test Set

sensitivity of the receiver is about -60 dBm. In this example the 4 W signal is +36 dBm, and therefore the -40 dB attenuator will drop the signal level to -4 dBm. A further -56 dB of attenuation, from the step-attenuator set, will result in a signal level of -60 dBm being presented to the receiver's input.

Suppose we want to check for harmonics. For a 7 MHz source, the generator is adjusted as described above for a f.s. reading at 7 MHz (not 3.5 MHz, or any lower frequency than the "fundamental"—otherwise serious errors will result) and the number of dB "in-line" is noted. We can then tune to the expected harmonic frequencies of 14, 21 and 28 MHz. If a harmonic is more than -30 dB down, we may not be able to easily detect it by looking at the meter, or listening, so the amount of attenuation may be reduced (switched out) in steps of say, 10 dB, and harmonics looked for again. We may hear a weak signal at 14 MHz for instance.

The attenuator is again adjusted to obtain f.s. reading. The new attenuation reading is now subtracted from the initial reading to obtain the actual number of dB that the harmonic (or other spur) is below the fundamental. Let's assume we had 56 dB worth of attenuation in-line as noted before, but this had to be reduced to only 14 dB to obtain f.s. on the 14 MHz harmonic; $56 - 14 = 42$. The 14 MHz harmonic is therefore 42 dB below the fundamental, which would be an acceptable figure. Sounds tricky, but with a bit of practice on various sources, the technique is soon learned, and becomes a powerful tool in our measurement repertoire.

The same basic method may be applied to test for non-harmonically related spurs, but now the entire HF spectrum to 60 MHz should be carefully searched. If no spurious signals are found, some attenuation is removed, and another search is made. If a signal is now found, the same procedure as noted above may be used to determine the value, in -dB, of the unwanted signal. Should the fundamental- or main signal be accidentally tuned after 40 or so dB has been removed, the meter will pin, but not so violently that any damage is done (the diode at the FET gate limits the voltage to a reasonable level, and the '602 can take a lot of punishment. The -20 dB maximum signal level refers to linearity—not damage). Care must be taken when searching below the fundamental. In the example shown above, if we tuned the generator to 3.5, 2.33 or 1.75 MHz for instance, we would hear a strong signal, but these are "legal" products of the generator's harmonics and the fundamental.

To measure gain (an amplifier), or loss (an attenuator, filter, or other passive

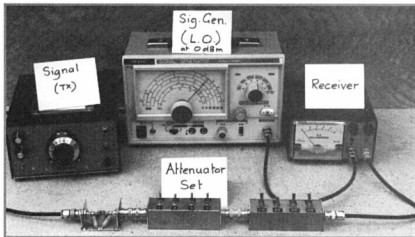


Photo 3. Typical measuring set-up

device), the technique is simply an extension of the above. A second signal source, or generator, is required. The second generator is first tuned in and the attenuator set is adjusted to obtain f.s. on the meter. The device under test (DUT) is placed between the second signal source and the step attenuator set (keeping power levels in mind). If an attenuator is being tested, insertion of the DUT will cause the meter reading to fall. The amount of attenuation which needs to be switched out to restore f.s. equals the attenuation of the DUT. Conversely, if an amplifier is inserted, the gain of the amplifier equals the amount of additional attenuation necessary to restore f.s. Repeat at as many frequencies as necessary.

Similarly, a filter's pass-band and stop-band attenuation can be determined. For example, a 7 MHz low-pass filter for a transmitter may first be measured for pass-band loss at 7 MHz by substitution. A typical figure may be perhaps less than 0.3 dB. Then the test frequency is increased in convenient steps up through the roll-off region and into the stop-band, where the attenuation (for a typical 7-element filter) may be 40 or 45 dB.

Parts

No fancy or hard-to-get components are specified, and the majority of them are available from the usual electronics vendors, such as Altronics, Dick Smith, Jaycar, Rockby and Electronics World. NE(SA)602AN's and 100 R 3 W metal film resistors are available from Electronics World (03 9723 3860), who also answer mail orders. D.S. have the 10 mH RFC's and 470 nF monolithic caps. I always keep a few spares, so if you have genuine

difficulty in obtaining any of the parts specified, please send a request and SASE to the address shown.

References and Further Reading:

1. For an explanation of "dB": look up "Decibels" in any recent radio handbook.
2. See also Chapter 12 of "The VHF/UHF DX Book"; White, DIR Publishing.
3. "Paddyboard" Circuit Construction"; Diamond, AR, Feb. '95.
4. "Build It Yourself From QST"; Hale, KB1MW, QST, Apr-July '92 (series).
5. "How to Lay Out RF Circuits", White, G3SEK, Rad Com, Feb-Mar. '91.
6. "Try Building Your Own Equipment" Diana, N2JGU, QST, Mar. '95. 7.
7. "Improvements to Signal Generator model Q-1312"; Diamond, AR, Apr. '99.
8. "An Attenuator Set for Receiver Sensitivity Measurements"; Diamond, AR, Aug '99.

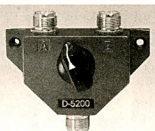
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Gain: 13.5dB
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For various technical and operational reasons, amplitude modulation (AM) continues to be used by some services. Most well-known of course is in broadcasting on LW, MW and SW. Aircraft use VHF AM for its lack of "capture" effect (where two FM signals are present, it is difficult to hear a weak signal under a stronger one). On the amateur bands, numerous enthusiasts keep alive the spirit of AM, particularly on 160 M, where here near Melbourne for instance, a popular regular mid-morning net runs on 1825 kHz. Another stimulating net runs on 80 M/ 3580 kHz each Friday starting 1230 Z. 40 M too attracts a number of AM users.

During periods of low occupancy, the additional bandwidth required by AM is not usually a problem, and so it may even be possible, if desired, to aim for something approaching "broadcast quality", which indeed some stations do. Having listened "on the side" to many interesting AM QSO's, and not being able to join in, motivated me to have a go at building a little AM/CW transmitter. The simplification of crystal control is not a serious handicap, because, as far as I know, only a handful of frequencies are regularly used for AM (and 3580 kHz is a common cheap crystal frequency).

There is an abundance of valve designs in the standard radio handbooks pre circa 1965, but it was felt that a solid-state plan would be more acceptable (and some of our younger members may not be particularly comfortable with valves- and where does one get things like "mod-trannies"?). I therefore offer the following circuit, which was a lot of fun to build and get going, and intentionally uses purchasable components.

Characteristics

Bands: 1.8, 3.5 and 7 MHz.

Output Power: 25, 20, 15 Watts CW. 16, 12, 8 Watts AM.

Spectral Purity:

Harmonics at least -40 dB below fundamental.

Modulation bandwidth at the -3 dB points is 100 Hz to 10 kHz. However, spectrum should be conserved by using a microphone with limited frequency response. The prototype employs a "rocking-armature"

type telephone receiver as microphone, which provides quite adequate voice-quality transmission.

On CW mode, the keyed wave-form is "text-book" in appearance. The device

makes a very acceptable 3-band CW VXO transmitter, particularly on 3.5 MHz, where an ordinary 3.580 ceramic resonator covers about 3.515 to well over 3.6 MHz- the best of CW segment, and much of the 'phone band.

Circuit

The classic oscillator (VXO)-buffer-driver PA configuration is used. Depending upon crystal type, a useful "pull" of the nominal frequency is obtained. Very light coupling (1 pF) between VXO and buffer effectively isolates the keyed and modulated stages from the VXO. The BFR84 buffer amplifier provides gain, and a means of adjusting the drive level by use of a pot at Gate 2, which



Photo 1. AM/CW Transmitter

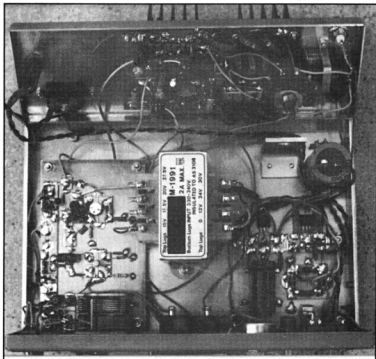


Photo 2.. General Layout

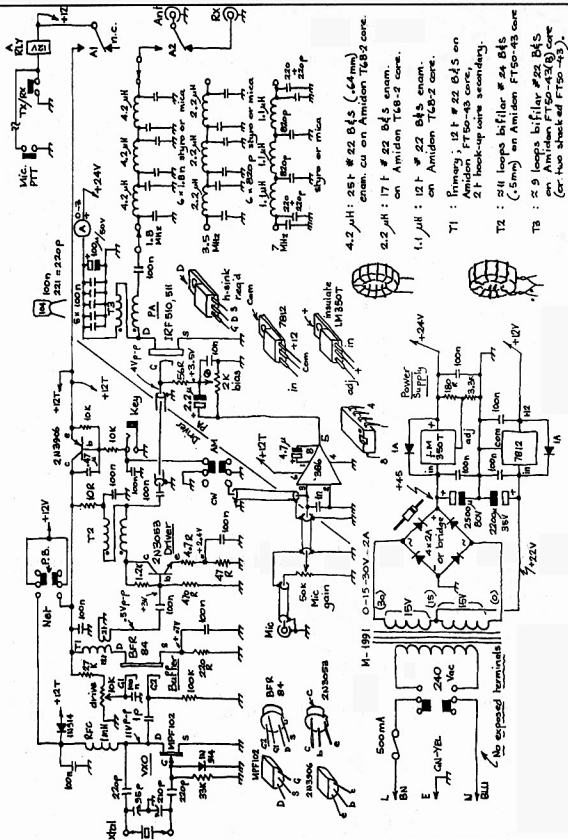


Figure 1

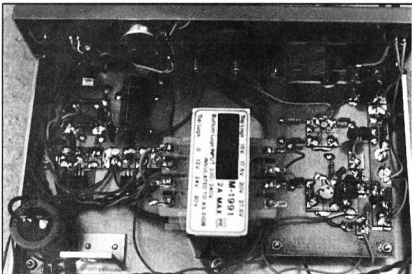


Photo 3. Power Supply and VXO

varies the DC voltage applied to G2.

Driver, type 2N3053 provides further gain, and impedance matching to the gate of the PA MOSFET. A relatively low gate load resistance of 56 ohms is used in order to "swamp" the rather large gate-source capacitance at the input of the IRF510, and thus make driving the IRF510 less frequency dependant than if we relied on a higher impedance gate resistance.

For both CW and AM operation, the no-signal gate bias on the IRF510 is held at a value (typically +3.5 to 4V) which provides class B operation of the PA stage. That is, near the point of drain current cut-off. This bias voltage is derived from the output of an

LM-386 audio-amp IC. With a nominal supply voltage to the '386 of 12 V, the quiescent DC output from the chip will be about half supply; 6 V.

Amplitude modulation of the RF waveform is accomplished by varying the gate voltage with our audio signal from the mike and '386. The gate voltage/drain current transfer function is quite sensitive, and only a relatively small audio signal (from the '386) is required to obtain full 100 % modulation. The PA operates in similar mode to a class B SSB linear amplifier, where the output tank supplies the missing RF half-cycles by flywheel action. In this instance, the (necessary) output low-pass

filter, even though it is of very low Q, does the job. On AM, the output power is run at approximately half the CW level, thus allowing headroom for correct "upwards" modulation.

On CW mode, 12 V supply to the buffer and driver is ramped up and down in response to the key with a 2N3906 as keyer/shaper. The VXO is not keyed, but runs continuously during transmit periods.

After much experimentation with the PA supply voltage, it was found that about 24 to 30 V results in best modulation, keying and output power characteristics. A common 0-15-30 V (or "15 volts-a-side") 2 Amp transformer is ideal for the power supply. An LM-350T regulator chip is wired to supply +24 V for the PA, and a '7812 chip supplies +12 V for the low-level stages.

Construction

The prototype is built in a home-made aluminium box measuring 250 x 195 x 80 mm WDH. Any ventilated metal box or case of similar dimensions will do. Photo 2 shows the general layout, where the back PA/heatsink panel has been dropped down for clarity. The schematic attempts to show that the VXO/buffer/driver is accommodated upon one circuit board, the PA/audio amp. on a second board, and the power supply on a third. It would be a good plan to build the project in stages, starting with the power supply, VXO/driver board, then PA/audio board. Hence, each stage may be tested as you go.

"Paddyboard" (see Ref. 2) style construction was used for the three boards, which measure 130 x 80 mm for the VXO/buffer/driver, 130 x 70 mm for the PA/audio amp., and 85 x 70 mm for the power supply. Yours may be slightly larger or smaller as desired, but try not to crowd things too much. Layout is not particularly critical. However, all leads and un-shielded wires which carry an RF signal must be reasonably short. Use ordinary hook-up wire for DC connections. All mains wiring must be covered to prevent accidental contact, and mains earth must be connected to chassis with a dedicated solder lug, screw, lock-washer and nut.

The variable capacitor for the VXO should be mounted so that the shaft projects through the front panel, as shown in Photo 3. Any ordinary physically small 2-gang type will do. Mine uses one of those MSP 95/210 pF gangs which have been available around the ham-fests for years. Largest "pull" will be obtained with a dual 415 pF BC type (but note that some crystals will mode hop, or drop out if pulled too far).

Transformer T1 is an Amidon FT

ar

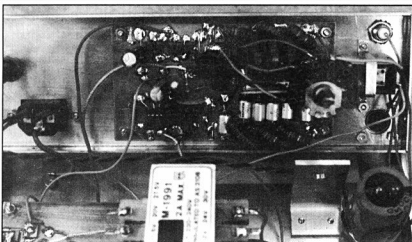


Photo 4. PA Board and low-pass filters

NOVICE NOTES

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Novice Notes Online: <http://www.alphalink.com.au/~parkerp/nonline.htm>

Please note that this is Peter's correct address.

Exploring Rechargeable Batteries

Rechargeable batteries: they're used everywhere and there's many different brands and types. Almost every amateur has their own opinions on the merits of different types and the best ways to look after them. This month we examine the main types available and their suitability for various equipment amateurs use.

How rechargeable batteries work

Batteries convert stored chemical energy into electrical energy. This is achieved by causing electrons to flow whenever there is a conductive path between the cell's electrodes.

Electrons flow as a result of a chemical reaction between the cell's two electrodes that are separated by an electrolyte. The cell becomes exhausted when the active materials inside the cell are depleted and the chemical reactions slow. The voltage provided by a cell depends on the electrode material, their surface area and material between the electrodes (electrolyte). Current flow stops when the connection between the electrodes is removed.

Rechargeable cells operate on the same principle, except that the chemical reaction that occurs is reversed while charging. When connected to an appropriate charger, cells convert electrical energy back into potential chemical energy. The process is repeated every time the cell is discharged and recharged.

Different cells use different electrode materials and have different voltage outputs (1.2, 1.5, 2 and 3.6 volts for the types discussed here). Higher voltages are possible by connecting cells in series. A set of several cells connected together is called a battery. However, because lay people do not distinguish between a 1.5-volt cell and a 9-volt battery (which comprises several cells), the term battery is widely used for both batteries and cells.

The capacity of cells is expressed in amp-hours (Ah) or milliamp-hours (mAh). The approximate time that a battery will last per charge can be found by dividing the battery pack capacity (normally written on the battery pack itself) by the average current consumption of the device. Thus a 600-mAh battery pack can be expected to power a receiver that takes 60mA for 10 hours.

Cells can be visualised as consisting of a cell with a resistor in series. You won't find an actual resistor should you split open a battery pack, but the effect is the same. Some battery types have higher values of internal resistance than others. High internal resistance doesn't matter if powering items that draw fairly low currents (eg a clock or small receiver). However, if running something like a 5-watt handheld transceiver, a battery with a high internal resistance will not deliver the current asked of it.

Having explained some of the characteristics important to all batteries, we will now look at each cell type in turn.

Nickel-cadmium (NiCad)

Nickel-cadmium cells are the most commonly used rechargeable batteries in consumer applications. They come in similar sizes to non-rechargeable cells, so they can directly replace non-rechargeable alkaline or carbon-zinc cells. NiCads have a lower voltage output than non-rechargeable cells (1.2 vs 1.5 volts). This difference is not important in most cases.

NiCad battery packs have voltages of 2.4, 3.6, 4.8, 6, 7.2, 9, 10.8 volts, etc. This corresponds to 2, 3, 4, 5, 6, 7, 8 and 9 cells respectively, shown in the following table:

cells							
2	3	4	5	6	7	8	9
volts							
2.4	3.6	4.8	6	7.2	8.4	9.6	10.8

NiCads perform best between 16 and 26 degrees Celsius. Their capacity is reduced at higher temperatures. Hydrogen gas is created and there is a risk of explosion when cells are used below 0 degrees.

NiCad batteries have a low internal resistance. This makes them good for equipment that draws large amounts of current (eg portable transmitting gear). However low internal resistance means that extremely high current will flow if cells are short-circuited (as much as 30 amps for a C size cell!). Short-circuiting should be avoided as it can cause heat buildup and cell damage.

Most portable transceivers come with NiCad battery packs where the cells are welded to metal connecting straps. There is good reason for this. In high-current

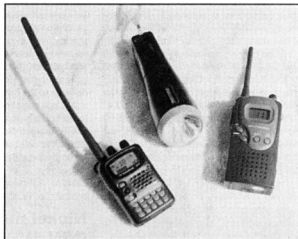


Photo 1. Rechargeable batteries now widely used in a range of electronic equipment.

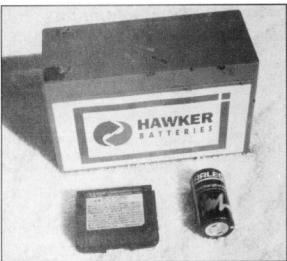


Photo 2. Shown are three types of rechargeable battery - lithium ion, nickel cadmium and sealed lead acid.

applications, the unknown (and varying) resistance between cells and battery holder contacts can result in erratic operation. This is especially so when the transceiver is used in a salt-laden environment. An encased battery pack overcomes these difficulties and provides more reliable operation.

The normal charging rate is 10 per cent of a battery's capacity for 14 hours. For example, if a battery pack has a 600-mAh rating, its correct charging current is 60 mA. Because the charging process is not 100% efficient, the charger needs to be left running for about 14 hours instead of 10 hours. Higher charging currents are possible, but the charging time needs to be proportionally reduced. NiCads can be left on a trickle charger indefinitely if the charging current is reduced to 2% of the battery's amp-hour rating. Avoid the build up of heat during charging for long battery life.

NiCad batteries require a constant current charger; ie one where the current provided to the battery is fixed over the entire charging period. Such a charger can be something as simple as an unregulated DC power supply with a series resistor to limit the charging current into the cells. If the charger's voltage and the battery's desired charging current are known, Ohm's Law can be used to calculate the correct series resistor value. Because NiCads have a low internal resistance, proper charging can occur with several cells in series.

For best life, do not discharge NiCads to less than 1.0 volt per cell. When charging, NiCads should read 1.45 volts per cell. If the cell voltage is higher during charging (eg 1.6 or 1.7 volts), the cell is faulty and should be discarded.

that true 'memory effect' is rare. It was first noticed in communications satellites where cells were discharged to precisely the same discharge point every time. In casual amateur use batteries are most unlikely to be discharged to the same point after every use. Much of what is mistaken for the 'memory effect' is voltage depression, which is caused by long, continuous overcharging, which causes crystals to grow inside the cell. Fortunately both the 'memory effect' and voltage depression can be overcome by subjecting the battery to one or more deep charge/discharge cycles.

Another term you will hear is 'cell reversal'. This can occur when a battery of cells is discharged below its safe 1.0 volt per cell. During this discharge, differences between individual cells can lead to one cell becoming depleted before the rest. When this happens, the current generated from the remaining active cells will 'charge' the weakest cell, but in reverse polarity. This can lead to the release of gas and permanent damage to the battery pack.

NiCads can short circuit due to the build up of crystals inside the battery. The use of a fully charged electrolytic capacitor placed across the cell can effect a temporary cure. Over discharging of batteries invites short-circuiting. Batteries should be stored charged. A lifespan of 200 to 800 charges is typical for NiCad batteries.

Nickel metal hydride (NiMH)

Like NiCads, nickel-metal hydride cells provide 1.2 volts per cell. Battery makers claim that NiMH cells do not suffer from

You'll often hear discussions about the so-called 'memory effect' exhibited by NiCad cells. This refers to the claimed tendency of cells not to deliver their rated voltage when placed in a charger before being fully discharged. Belief in the existence of the 'memory effect' is widespread amongst users of NiCad batteries. However, textbooks and data from battery manufacturers make little or no mention of it. Believers say that to prevent it batteries must be discharged to 1 volt per cell before charging. Non believers say that this discharging merely reduces cell life.

Evidence suggests that true 'memory effect' is rare. It was first noticed in communications satellites where cells were discharged to precisely the same discharge point every time. In casual amateur use batteries are most unlikely to be discharged to the same point after every use. Much of what is mistaken for the 'memory effect' is voltage depression, which is caused by long, continuous overcharging, which causes crystals to grow inside the cell. Fortunately both the 'memory effect' and voltage depression can be overcome by subjecting the battery to one or more deep charge/discharge cycles.

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the 'memory effect' and can be recharged up to 1000 times.

NiMH cells are not as suitable as NiCads for extreme current loads, but do offer a greater capacity in the same cell size. A typical AA NiCad may have a 750 mAh, but a NiMH may provide 1100 mAh - 45 percent more. This makes NiMH cells a good choice for applications where long life is desired but current demands are not high eg portable receiving equipment.

NiCad chargers can be used to charge NiMH batteries, but the charging time needs to be lengthened to take NiMH's typically larger capacity into account. The main enemy of rechargeable cells is heat. If cells get hot during charging, reduce the charging current to no more than that recommended.

Rechargeable alkaline manganese

Unlike the preceding two battery types, rechargeable alkaline manganese (RAM) cells give 1.5 volts each. They are therefore suitable for applications where the substitution of 1.2-volt NiCads for 1.5-volt dry cells results in degraded equipment performance.

RAM cells are cheaper to buy than NiCads. They can be recharged between 50 and 750 times. They also have a greater capacity than do NiCads - 1500 mAh is typical for size AA cells. RAM cells are good for use with outdoor and solar equipment as they will work efficiently at temperatures up to and exceeding 60 degrees Celsius.

RAM cells have a much higher internal resistance than NiCads (0.2 ohms vs 0.02 ohms). This means that they cannot supply high peak values of current. For this reason they are unsuitable for use with standard amateur HTs. However, their high capacity and long shelf life (5 years) makes them suitable for low powered or emergency-use applications, such as clocks and emergency torches.

Chargers intended for NiCad and NiMH cells will not charge rechargeable alkalines. This is because rechargeable alkaline cells require a constant voltage source of between 1.62 and 1.68 volts to charge. RAM cells should be connected in parallel rather than in series when charging several cells at a time. Unlike other rechargeable batteries, RAM cells are pre-charged and do not require charging before first use.

Lithium Ion

Lithium ion cells are the most recent of the battery types discussed here to come onto the market. They offer higher cell voltage (3.6 volts) and greater capacity for a given volume. This makes them especially

suitable for handheld equipment where long operating times are important, such as mobile phones.

As an example of what Lithium ion battery packs can do, the battery pack pictured is 55x45x20mm but provides 7.2 volts with an 1100 mAh capacity. Lithium ion batteries are still quite expensive, but are coming into amateur use through their inclusion in handheld transceivers such as Yaesu's VX-1R and VX-5R models.

Sealed lead acid

Sealed lead acid batteries (or 'gel cells') are less popular than NiCads in handheld equipment, but find widespread use as back up batteries in security systems and for amateur portable operation. Per-cell voltage is 2.3 volts when charged, and 1.8 volts when discharged. This equates to 13.8 and 10.8 volts respectively for a battery of six cells. For best use of the full battery charge, equipment intended to operate with '12 volt' sealed lead acid batteries should operate well (if not at full power) at voltages of 10.8 volts or less.

Gel cells are cheap, rugged and reliable and should last several years at least. If you want a battery to run a QRP HF station or a VHF/UHF handheld for several hours, they are the ideal choice. They are also widely used with small solar systems.

Sealed lead acid batteries can either be used on a cyclic charge regime (battery connected to charger for a specific time) or continuous float use, where the battery is used as the charger any time it's not in use. Cyclic chargers should charge at 2.4 or 2.5 volts per cell and be current limited to prevent overcharge. In contrast continuous float charging (or trickle charging) requires a charging voltage of only 2.3 volts per cell (13.8 volts for a '12 volt' battery). With both types of use the charger voltage is held constant. Connect batteries in parallel if charging two or more from the one charger.

Chargers for sealed lead acid batteries are available commercially or can be made at home. Special gel cell charger ICs exist to provide the necessary voltage and current regulation. Alternatively chargers can be made from the more common regulator chips such as the 723 or LM317. These chargers can be used to directly trickle charge the smaller '12 volt' gel batteries. No damage is done if the charger remains on, even when the battery is fully charged. This is because as the battery voltage approaches 13.8, the charging current will fall to negligible levels.

Sealed lead acid batteries should not be charged at voltages higher than those indicated as safe above. This is because high charging voltages (eg 2.6 volts per cell.) will

endanger the battery due to the production of excess gas. At a 13.8 volt charging voltage the production of gas is low, and the battery should give years of service. Charging current should not exceed 20 per cent of the rated amp hour capacity of cells. If using a high current 13.8-volt power supply as a charger, some form of current limiting is desirable to stay within the battery's limits.

Conclusion

This article has examined the characteristics of all major types of rechargeable batteries used by amateurs. We learned that NiCads and sealed lead acid cells were best for high current applications, while other varieties, such as rechargeable alkaline and nickel metal hydride work well for low current applications. The charging of batteries varies too - Rechargeable alkaline and sealed lead acid required a constant voltage, but nickel cadmium and nickel metal hydride cells needed a constant current to charge properly. In all cases over-charging, through excessive voltages, currents or charging periods can cause heating, gas build-up and possible cell damage. However, if you treat your batteries well, you should have many years of successful operation from them, whichever type you choose.

Acknowledgments

I wish to acknowledge the people and organisations that have contributed to the writing of this article. These include:

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Adeal Pty Ltd for information on Varta's range of NiCad and NiMH cells.

References

1. Hawker P G3VA, Technical Topics Scrapbook 1990-1994, RSGB, pages 1, 16, 142
2. ARRL, Handbook 1988, ARRL, pages 6-25, 27-32
3. Gruber N WA I SVF, QST November 1994, ARRL, page 70.

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TECHNICAL ABSTRACTS

Gil Sones VK3AUI
30 Moore Street
Box Hill South Vic 3128

Feedline Verticals

A useful antenna for portable use was described in CQ August 1999 by Rolf Brevig LA1IC. The antenna is a half wave vertical made of coaxial cable with a resonant choke to isolate the radiating part of the antenna from the feedline outer.

The antenna is shown in Fig 1. The half wave dipole is made from the coaxial cable used for the feedline. The upper quarter wave or upper half of the dipole has the outer and braid stripped. The lower quarter wave which is the other half of the dipole is isolated from the feedline outer by a resonant choke formed from a coil of feedline.

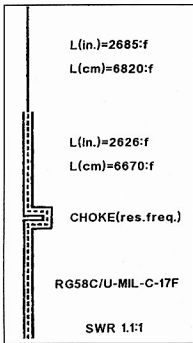


Fig 1. Feedline Vertical with Resonant Choke.

The choke for two metres consists of 4.6 turns on a 32mm (1.25 in) OD piece of PVC tubing. For six metres the choke is 11.8 turns on a 50 mm (2 in) OD piece of PVC tubing.

The antenna is suspended from a convenient point by a length of plastic cord. A loop in the top of the radiator helps to attach the suspension cord. You may need to adjust the length slightly to compensate for the loop but this is no more than part of the process of tweaking the antenna onto frequency.

Balanced Video

An interesting idea using a balanced transmission line for video appeared in the MATH'S NOTES column of Irwin Math WA2NDM in CQ August 1999. The idea was to use data balun transformers to allow video to be passed over an existing twisted pair. The application was to enable the use of existing cabling to a doorbell push button to carry video from one of the small video cameras monitoring the door.

The basic circuit for using a balanced line with unbalanced source and load is shown in Fig 2. The transformers used were the baluns sold for data use. These have one of the RJ11 connectors on the balanced side and a BNC connector on the unbalanced side. They have been available recently from Jaycar and should be available in the computer and data industry.

A somewhat more complicated circuit was used as it was necessary to use a phantom circuit to run the doorbell and power the camera. This is shown in Fig 3. The baluns had to be modified in order to provide the centre taps. The modification

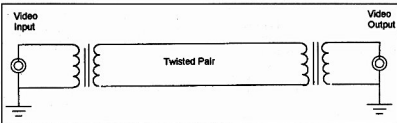


Fig 2. Balanced Video Transmission over a balanced pair.

involved unwinding them to make the centre tap and then rewinding. This should be done carefully as the circuit operation depends on the centre taps being accurate. The AC power source cancels in the balanced circuit and so does not affect the video. There is some disruption when the push button is activated.

The camera power is obtained by a bridge rectifier and filter from the AC used by the bell/chime circuit. The power required is small compared to that necessary for the operation of the chime, which is powered from a small transformer.

For longer runs video equalisation may be needed as many twisted pair cables do not have an extended upper frequency capability.

Skeleton Slot Revisited

The skeleton slot was a popular antenna some time ago. The design appeared in the sixties in the RSGB Handbook and was also sold as a factory built antenna by Jaybeam. The design uses a skeleton slot to feed two Yagi arrays spaced five eighths of a wavelength by the feed arrangement of the skeleton slot.

In Break In July/August 1999 Peter Johnson ZL4LV provides an update of the original which he optimised using the AO6.5 Antenna Optimiser program from Brian Beezley K6STI. The program is advertised in QST along with a number of antenna programs and it was possible to input the configuration of the skeleton slot antenna using the program.

A computer plot of the antenna is shown in Fig 4. A comparison of the original antenna and the optimised design both calculated by the program are shown in Fig 5. The dimensions are given in Table 1. The antenna is built with insulated mounting of all elements. The feed makes use of the original delta but with a quarter wave matching section to 200 Ohms where a coaxial loop balun is used to match to 50 Ohm coaxial cable. To duplicate the antenna it would be necessary to look at the RSGB Handbook which still carries the original design.

The use of computer modelling makes antenna design simpler than building many models but you must ultimately check the result by building the design and seeing how it performs.

ar

Table 1

Frequency 144.25 MHz	Dimensions in Inches.
Element Diameter	0.375 Inches (3/8 inch)
Reflector Length	39.58 Inches
1st Director Length	37.86Inches
2nd Director Length	35.31 Inches
3rd Director Length	36.29 Inches
4th Director Length	34.53 Inches
Spacing Driven Element to Reflector	8.16 Inches
Spacing Driven Element to 1st Director	2.45 Inches
Spacing Driven Element to 2nd Director	33.75 Inches
Spacing Driven Element to 3rd Director	58.79 Inches
Spacing Driven Element to 4th Director	82.42 Inches
Width of Horizontal Part of Skeleton Slot	15 Inches
Height of Vertical Part of Skeleton Slot	44.75 Inches
Short Joining Section Between Y and Skeleton Slot (f)	1 Inch
X axis length of Y section plus "f"	7.625 Inches
Matching Section (m) Quarter Wave plus "f" and "e"	28.75 Inches
Centre to centre spacing of matching section	2 Inches

The matching section appeared to be made of the same material as the elements and the skeleton slot.

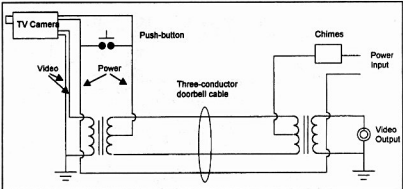


Fig 3. Transmitting Video over a twisted doorbell cable.

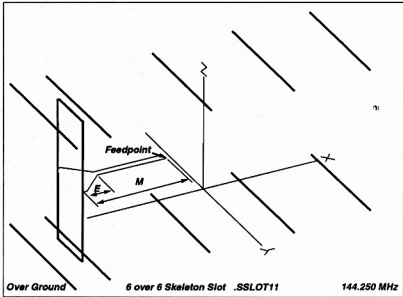


Fig 4. Computer Plot of 6 over 6 Skeleton Slot Antenna.

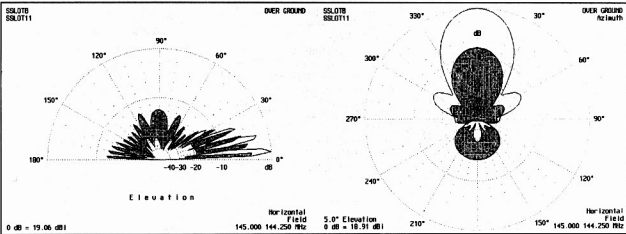


Fig 5. Plots of ZL4LV's original antenna (Shaded) and Optimised Plot (Overlaid). Left: Elevation Plot Right: Front to rear plot.

AMSAT AUSTRALIA

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AMSAT Australia net:

The AMSAT-Australia net is held on 80 or 40 meters LSB (Lower Side Band) each Sunday evening (except over the Christmas/New Year period). During the winter months in South Australia (end of March until the end of October) the net is on 3.685 MHz +/- QRM with an official start time 1000UTC with early check-ins at 0945UTC. During the summer months when daylight saving is in operation in South Australia (end of October until end of March) the net is on 7.068 MHz +/- QRM with an official start time of 0900UTC with early check-ins at 0845UTC. The times and frequencies have been chosen as the best compromise for an Australia-wide net taking into consideration seasonal propagation changes and the various state summer time variations.

**AMSAT Australia
newsletter and software
service:**

The newsletter is published monthly by Graham VK5AGR. Subscription is \$30 for Australia, \$35 for New Zealand and \$40 for other countries by AIR MAIL. It is payable to AMSAT Australia addressed as follows:

**AMSAT Australia
GPO Box 2141
Adelaide SA 5001**

Kepplerian Elements.

Current keps are available from the internet by accessing the AMSAT FTP site, ftp.amsat.org and following the sub-directories to "KEPS".

the planned VOXSAT-1 are examples. ISS will have equipment suitable for 'entry-level' operation, as will Phase 3-D. With the rise in popularity of the 'Pico-satellites' concept, this trend should continue into 2000 and beyond giving the newcomer many easy and satisfying avenues into AMSAT activities.

One of the major news items of 1999 was the signing of a launch agreement with ArianeSpace for the launch of the new

This year we have watched as the new International Space Station (ISS) takes shape to replace MIR. As we have come to expect, AMSAT stalwarts have been involved since the outset to ensure that Amateur Radio is an integral part of the new space complex. Amateur radio equipment will be on board, ready and waiting for the first crew to arrive to activate the station.

Graham VK5AGR participated in the San Diego symposium in October. He noted in the newsletter on his return just how difficult it is to gain 'space qualification' to fly amateur radio equipment on a manned space flight. Without the dedicated effort of the ARISS team the dream of amateurs communicating with Astronauts on the ISS would remain just that, a dream.

Earth imaging via amateur radio took a giant leap forward early this year with the commissioning of the Surrey satellite TMSAT-1, TO-31. Its high resolution digital cameras and wide band downlinks have caused us all to re-appraise the picture quality expected from 'amateur' satellites. The bar has been raised several notches and has taken amateur radio satellite imaging to a level rivalling that of commercial earth-imaging satellites. This has probably been the major challenge thrown out to the amateur radio satellite community in 1999. For some time it looked like this new area may be put in the 'too-hard-basket' by many amateurs but as is usually the case, amateur ingenuity has come to the fore. New, simple ways around the problems of wide bandwidth reception and high speed modems have begun to emerge. This promises to be one of the most exciting areas of interest in the coming year. Superb quality pictures at download rates rivaling a fast internet connection could become commonplace.

Newcomers to AMSAT activities have been overlooked in 1999. Whilst the emphasis has been on complex digital technology over the past few years, in 1999 we have seen a trend towards a 'back-to-basics' approach. The analog FM transponder of SUNSAT OSCAR-35 and

Summer Time and the AMSAT Sunday Evening Net.

As the heading indicates, the Sunday evening nets have moved from 80 metres to 40 metres for the duration of summer daylight saving. Early call-ins to the net are welcome from 0845UTC on 7.068 MHz +/- QRM. Due to the fall of dates this year, the nets will not be conducted on Sunday 26th December 1999 or on Sunday 2nd January 2000 as both of these occur during the Christmas/New Year holiday break.

The Year in Review.

Well, here we are at the end of 1999. I won't enter the debate regarding whether or not it marks the end of the current century, the millennium or whatever. Many will have the view that it's just the end of another hard year. In any case it's a good enough excuse for a party and I'm sure there will be a lot of celebrating come December 31. It is my personal hope to celebrate by watching as my computer tracks a satellite successfully across the transition from Dec 31 1999 to Jan 1 2000. Forward predictions indicate that a number of likely candidates including the 'old-faithful' Oscar-10 will be in our sky at that time.

There is certainly good reason to celebrate in AMSAT circles. We have seen another bumper year in the Amateur Radio Satellite Service. Our heroes have been hard at work and continue to provide us with a host of new satellites and new modes of operation. A lot of new launches took place in 1998 and although 1999 has seen the birth of only one brand new satellite, SUNSAT OSCAR-35, this year has heralded the re-birth of an old friend, KO-23 and the successful commissioning of several satellites that were born in 1998.

The final crew departure and end of amateur radio operations from the Russian Space Station MIR was one of the more nostalgic events of 1999. What wonderful fun it was to be able to communicate with all those Cosmonauts over so many years.

Phase 3-D satellite. This is how it was announced on the Arianespace internet web site.

*Arianespace Launch To Benefit Amateur Radio Operators
15-OCT-99 Geneva.*

Today at Telecom '99, Arianespace and AMSAT-DL, the German branch of the international amateur radio satellite community, announced the signing of a launch contract for the AMSAT Phase 3-D communications satellite, to be carried aloft on an Ariane 5 as auxiliary payload.

The launch will take place in the year 2000 from Europe's Spaceport in Kourou, French Guiana. AMSAT Phase 3-D will be one of the first secondary payloads boosted by Ariane 5, which will use a special adaptor for orbital injection.

Weighing 650 kg (1,430 lb) at launch, AMSAT Phase 3-D will be injected into a geostationary transfer orbit. It will then use its own propulsion system to reach elliptical orbit (4,000 x 47,000 km, inclined at 60 degrees), where it will be used as a relay by the international community of amateur radio operators for nearly ten years.

In 2000, Arianespace will also inaugurate its new ASAP-5 (Ariane Structure for Auxiliary Payloads), designed for micro-satellites weighing less than 100 kg (220 lb) or mini-satellites weighing less than 300 kg (660 lb). ASAP-5 replaces the previous-generation ASAP-4, which has been used 6 times on Ariane 4. Arianespace has orbited some 27 auxiliary payloads since 1980.

All AMSAT personnel can take some pride from the mention of ASAP-4/5 in those last paragraphs. AMSAT developers have kept the time-honoured amateur radio pioneering tradition alive despite the 'gloom and doom merchants' who keep telling us that amateur radio is dead. They have demonstrated to the world the worthiness of small, inexpensive, yet state-of-the-art satellite packages. The theme has been taken up by humanitarian aid agencies, higher education centres, countries with developing technology and now, recognition by Arianespace with their development of a launch system devoted to these small satellite packages. Not bad for an organisation which can trace its roots back to the building of Oscar-I in a basement garage in 1961. BRAVO! I think the AMSAT organisation can look forward to the new century/millennium with confidence.

SUNSAT SO-35 Doppler Compensation.

SUNSAT is proving to be a very popular satellite, particularly as it affords an opportunity for people with more modest equipment to experience satellite communication first hand. Many contacts can be monitored between stations using nothing more than VHF/UHF hand-held transceivers. Doppler shift, particularly on 70cm can be a challenge. A few minutes listening will reveal that it is those who take the trouble to compensate for frequency change who make the most successful contacts. Modern hand-held transceivers have copious memory capacity and it is possible to use this as a form of de-facto doppler compensation. Chris Hill VK6KCH has put together this explanation and given permission to print it here. Over to Chris:

"I thought I'd put together a list of frequency pairs which people can program into their radios, to use when operating SO-35's mode B. Coming up with the frequency pairs is quite easy... here they are (for nominal uplink of 436.291 MHz, nominal downlink 145.825 MHz):

Pair	Uplink	Downlink
A	436.280	145.830
B	436.285	145.825
C	436.290	145.825
D	436.295	145.825
E	436.300	145.820

But which pair to use at any given instant of time? The best method would be to use computer control (with fresh Keps and accurate time keeping) to automate the TX and RX frequency control (and rotate the 22 element Yagis etc). What about the more basic stations (like my hand-held FT-50R)? Trying to work any satellite while standing in a car park is less than ideal, therefore the simpler the instructions, the better! I have attempted to reduce the "which TX and RX frequencies to use versus time" issue down to a simple list of frequency pair versus elapsed pass time. The Doppler shift characteristic varies depending on the geometry of the orbit with respect to the observer. Simplifying SO-35's orbit to a circular orbit (it's slightly elliptical), a set of tables of which frequency pair to use versus elapsed time for a pass can be generated for various passes, each pass 'type' being classified by the maximum elevation which will be experienced during that pass.

Overhead Pass

For mid-latitude stations, an overhead pass will last approximately 13 minutes. Doppler on the UHF uplink is an almost constant +10kHz for the first third of the

pass (hence transmit low to compensate), rapidly changes as the satellite "zooms overhead", and is then an almost constant -10kHz for the last third of the pass (hence transmit high to compensate).

As the pass progresses, use the following pairs:

0.0 to 4.5 mins	A
4.5 to 5.5 mins	B
5.5 to 7.0 mins	C
7.0 to 8.0 mins	D
8.0 to 13.5 mins	E

58 degree Pass

Essentially the same as an overhead:

0.0 to 3.5 mins	A
3.5 to 5.5 mins	B
5.5 to 6.5 mins	C
6.5 to 7.5 mins	D
7.5 to 12.5 mins	E

13 degree Pass

Doppler shift on this type of pass follows an almost linear change throughout the pass, thus requiring more frequent changes, but making tracking less critical during the time of closest approach.

0.0 to 4.5 mins	B
4.5 to 7.0 mins	C
7.0 to 11.0 mins	D
11.0 to 12.5 mins	E

Why Bother?

Regardless of relatively wide IF filters being used on the satellite's receiver, the FM demodulator is going to exhibit optimal SINAD (Signal to Noise and Distortion) when the uplink signal is centred within the passband (rather than being pushed into one wall or another). Similarly, our receivers should be tuned to the Doppler shifted satellite's downlink signal, in order to exhibit the best possible SINAD. ("Best possible SINAD" is another way of saying "maximum sensitivity"). With the marginal power link budgets associated with handheld stations, optimal frequency operation may make the difference between a contact or no contact, whereas fixed stations with gain antennas and surplus power can afford to waste a few dB.

Thanks Chris. I use computer control via WiSP to achieve the above effect and I can assure you it is worthwhile to do SOMETHING about doppler compensation. If you give this system a go, you should be delighted with the results. Feedback would be good either to Chris or myself.

As usual, the January column will feature a summary of all currently operational amateur radio satellites, their transponder and beacon modes and frequencies.

A Merry Christmas and Happy New Year to you all.

Bill...VK3JT



AN EXPANDING WORLD

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All times are UTC

The Ross Hull Memorial Contest

This year marks the fiftieth anniversary of the inauguration of the Ross Hull Memorial Contest and has become known as the Golden Anniversary Contest. It will run from 26 December 1999 to 16 January 2000. In addition to the usual trophy and certificates, a 50th anniversary trophy will also be awarded, making the contest worth entering.

The Ross Hull Contest Manager John VK3KWA, has featured the contest rules more elaborately in this issue in the Contest pages. Also, I have prepared a special article on Ross Hull himself that appears in this issue.

Collectively, we are doing our best to promote the contest, the rest is now up to you, the contestants, to play your part by entering

Ross Hull Contest: List of winners: 1950 - 1998

1950 - 1951	VK5QR	R.V. Galle	1975 - 1976	VK5SU	J.W.K. Adams
1951 - 1952	VK5BC	H.F. Lloyd	1976 - 1977	VK4DO	H.L. Hobler
1952 - 1953	VK4KK	A.K. Bradford	1977 - 1978	VK3OT	S.R. Gregory
1953 - 1954	VK6BO	R.J. Everingham	1978 - 1979	VK4DO	H.L. Hobler
1954 - 1955	VK4NG	R. Greenwood	1979 - 1980	VK3ATN	T.R. Naughton
1955 - 1956	VK3GM	G. McCullough	1980 - 1981	VK6KZ	W.J. Howse
1956 - 1957	VK3ALZ	I.F. Berwick	1981 - 1982	VK6KZ	W.J. Howse
1957 - 1958	VK3ALZ	I.F. Berwick	1982 - 1983	VK6KZ	W.J. Howse
1958 - 1959	VK3ALZ	I.F. Berwick	1983 - 1984	VK6KZ	W.J. Howse
1959 - 1960	VK4ZAX	D.R. Horgan	1984 - 1985	VK3ZBJ	G.L.C. Jenkins
1960 - 1961	VK3ARZ	W.E.J. Roper	1985 - 1986	VK3ZBJ	G.L.C. Jenkins
1961 - 1962	VK5ZDR	M.J. McMahon	1986 - 1987	VK3ZBJ	G.L.C. Jenkins
1962 - 1963	VK4ZAX	D.R. Horgan	1987 - 1988	VK5NC	T.D. Niven
1963 - 1964	VK5ZDR	M.J. McMahon	1988 - 1989	VK5NC	T.D. Niven
1964 - 1965	VK3ZER	R.W. Wilkinson	1989 - 1990	VK3XRS	R.K.W. Steedman
1965 - 1966	VK3ZDM	J.R. Beames	1990 - 1991	VK3XRS	R.K.W. Steedman
1966 - 1967	VK5HP	J.H. Lehmann	1991 - 1992	VK3XRS	R.K.W. Steedman
1967 - 1968	VK3ZER	R.W. Wilkinson	1992 - 1993	VK3XRS	R.K.W. Steedman
1968 - 1969	VK5ZKR	C.M. Hutchesson	1993 - 1994	VK3XRS	R.K.W. Steedman
1969 - 1970	VK3ZER	R.W. Wilkinson	1994 - 1995	VK3XRS	R.K.W. Steedman
1970 - 1971	VK4ZFB	E.F. Blanch	1995 - 1996	VK2FZ/4	A. Pollock
1971 - 1972	VK5SU	J.W.K. Adams	1996 - 1997	VK2FZ/4	A. Pollock
1972 - 1973	VK5SU	J.W.K. Adams	1997 - 1998	VK2FZ/4	A. Pollock
1973 - 1974	VK5SU	J.W.K. Adams	1998 - 1999	VK3XPD	A. Devlin
1974 - 1975	VK5SU	J.W.K. Adams			

Six metres

Don VK6HK said that in a phone call, Bill VK6JQ at Broome reported working EY8CQ and EY8MM on 50 MHz on 10/10 around 0700, for probably the first VK-EY QSOs this solar cycle. VK6JQ runs 10 watts to a 6 element yagi and is on CW only.

Bill VK6JQ also reported working AP2WAP on CW and SSB on 15, 16 and 18th October around 0745-0945. He also comments in a letter that "Indian FM stations were heard on 50.100 each time contacts were made..." India and Bangladesh were being worked in Japan at the time as well. (No call signs provided). Bill also reports working 12 countries in Europe on 25th October, 1999). No details as yet.

Bill also mentioned that he had heard IW5BMI on 50.110 last November (7th) 1998 for probably the first EU-VK propagation this cycle. He worked A45ZN during the same opening. ... Don VK6HK.

[A letter arrived from Bill VK6JQ with details of his contacts just too late for inclusion here, but details next month. Bill said that up to 31/10 he had worked 19 countries in Zones 14, 15, 16 and 20, also Pakistan in 21 and Tajikistan in 17. Six metres is well and truly alive, he said. ... VK5LP.]

By e-mail Selva 9V1UV advised that he had been allowed to operate on six metres through the weekends of November. Of course, this was received too late for us, except those whom I could advise on the VK-VHF Reflector, but the following is of interest.

I am hoping that for the months December to January 2000 I will get a greater dispensation of facilities from the authorities such as permission to operate every day. I could let you know later.

A note from David VK2CZ says: *You would not believe the difficulties ham radio operators face in Singapore. I met Selva when he was working at DBS Bank while I was on contract in 9V1. The ham radio licence there is CW only for the first year, with choice thereafter. Yagis or any gain antennas are not allowed. Mobile or portable operation is not permitted. Make the most of this rare opportunity!*

Wally VK4DO reports considerable activity and contacts with stations across the Pacific, with the following as a sample: 2/ 10 0327 T31K; 6/10 0228 N6XQ, 0238 XEZEED; 7/10 0420/55 XE2/b and K5FV/b; 9/10 0850 VR2XMT, 0852 JD1BIA.

On 16/10 XE2U2L/b was in from 0335-0510 with QSB. Maximum strength was S3 around 0440. JA and KH6 at the same time. Many VK4s workable on backscatter.

17/10: 0030 XE1/b until 0200. *Worked T17WAM/4 CW 429. Difficult contact not really sure of the ?? may have been 6. Next 0136 K6MYC 5x5 DM06, 0150 N7STU 5x2, 0151 N6XP 5x3 DM06, 0153 N6AJ 5x2*

DM06, 0211 W6BYA 5x5 DM87, 0215 K6KLY 5x4 DM87, 0237 KG6KH 5x5 DM12.

For the second day in a row (18/10) there has been a good opening into the States. Oregon, California (San Francisco and Los Angeles), Arizona and Mexico. XE2b 0050-0350 up to S4. Contacts from 0124-0323. XE2EED worked A35SO at 0335. Heard VK4FNQ, VK4JH, VK4BLK in there.

I have put together some thoughts about the openings 17-20/10 into North America as they apply to this location.

The stations worked were in an arc, the distances being a narrow band of 11230 - 11600 km. This time there were no KH6 stations heard here, the distance being 7350 km. So it was either a single hop or a double hop missing KH6. The path to LA is 54 deg and XE2 is 60 deg, KH6 is 53 deg, so basically the signals pass over KH6. At the same times the West Coast USA were into A35 and FO0. XE beacons heard 16/10 to 20/10; Worked only W1VDE/7 CW 0305 CN92 Oregon.

The opening on 23/9 was around 13000 km and KH6 were in at the same time. One interesting observation is that all contacts in these openings have been in a narrow band each time spreading in an arc from here. Each time the XE beacons have given a strong indication of an opening, and are worth listening for. XE1, XE2 and XE3 are on the gulf coast. W1VDE/7 was using a rhombic 660 feet long from an elevation over 4000 feet.

Also, Wally reports that at last an opening from his QTH of Strathdickie into Europe. 3/11 0923 SP2SGZ JO82 5x3, 0929 DJ3TF JN59 5x3, 0933 SP4MPB KO03 5x3. Very quick and intense.

Les VK1BUC said that he worked 7J7ACV, JE2DWZ, JR1IQL on 15/10 between 0400 and 0430. Heard many other JAs. Ed VK1VP was also among them. The JAs reported working Hawaii shortly before the band opened to VK1.

Rob VK6TRC also worked the following on 15/10: 0500 JR1IQL 5x3, 0510 HL5XF 5x5, 0515 JA5NLN 5x7, 0612 JG7HRZ 5x9, 0615 JH7DFZ 5x7, 0620 JI3KGW 5x5.

Scott VK4JSR heard VK6BIK on 31/10 at 5x2 on backscatter during an evening TEP opening to JA. No other details.

Ray VK4BLK reports as follows: 24/9: 1134-1306 V73SIX/b 529. 25/9: 0358 DS1CCU/2 559. 28/9: 0250 XE2HWB 429; 0616 KH6IAA 5x6; 0622 AH6TM 5x2; 0625 K6MIO/KH6 5x4. 29/9: 0042 NH6YK 5x7; 0057 KH6SX; 0101 KH6IAA 5x7.

2/10: 0404-0520 V73SIX/b 539. 3/10: 0445 NH6YK 5x7. 6/10: 0227 N6XQ 5x5; 0233 XE2EED 4x4; 0237 KG6KH 5x4. 17/10: 0059 K5CM 539; 0110 N6XQ 529; 0117

XE1GRR 5x2; 0150 N6JV 559; 0155 K6MYC 5x4; 0220 W6BYA 5x4; 0222 N7STU 5x3; 0225 N6XQ 5x6; 0236 KG6KH 5x5; 0237 N6AJ 5x6; 0327 N6XP 5x5, N6AJ 5x5; 1136 V73CW 5x9. 18/10: 0226 KJ6HI 5x4; 0227 KO6WQ 5x4. K7JA 5x4; 0228 KF6FCE 5x5; 0229 N6JV 5x6; 0232 W7EW 559; 0234 W6QUV 569; 0238 W6WVK 569; 0239 N7CW 5x4; 0243 K6MYC 5x3; 0249 AB6PY 4x4; 0251 K6QXY 5x6; 0252 AA6G 5x5; 0254 K6FEE 4x4; 0322 WA6KLK 5x4; 0324 WD6HDY 5x4; 0326 W6YM 549; 0329 K6KLY 559; 0350 W6FV/b. 22/10: 2311 YJ8UU 5x4; 0650 JD1YBJ 559; 0809 JR6YAG/b 519; 0835 JD1BIA 5x5 Ogasawara Is. 24/10: 0717 KH4/W4ZYV 5x8. 25/10: 0325 W6IWM 5x5; 0331 K6QXY 559; 0356 AA1Z 549. 27/10: 0224 N6XQ 529.

From Doug VK4DUG: 23/9: 0053 W7XU 5x3; 0120 N0QJM 4x3, each South Dakota.

Warwick VK4NW from Bagara near Bundaberg: 1/9: 0235 J77ACU 5x8; 0310 HL5XF 5x7. 16/9: NH6YK 0220 5x4. 22/9: 0250 JA1WLA 5x5. 23/9: 0055 KA9CFD 5x9 EN40; 0100 ND0J 5x9 EN31; 0101 WA0CED 5x2 EN33; 0102 KCOBNZ 5x1; 0105 W0SD 5x9 EN15; 0106 KB0PYO 5x5 EN24; 0115 W7XU 5x7; 0125 N0QJM 5x7 EN30; 0126 W5EU 5x7; 0127 N5JEH 5x5 EM65; 0137 AA5XE 5x5 EM00; 0140 W5OZI 5x4 EM00. 28/9: 0435 JR2AJS 5x9; 0640 KH6IAA 5x4.

From Don VK6HK: Opening 24/10: Worked by Perth Stations on CW - 9M2JKL and 9V1JA. Heard 9M2TO/b 50.005. All around 0800-0920 at this station.

John VK4FNQ reports many contacts from across the Pacific. Because these are a representative sample of what was worked from North Queensland, they are presented in columnar form.

17/10

0132 N6XP DM06
0135 N6AJ DM06
0146 K6MYC DM06
0152 KB6NAN -
0154 K6KLY CM87
0212 W6BYA -
0215 FK8FU RG37
0223 N6XQ -
0729 WH6O -
1240 VK4BLK -

18/10

0055 K7ICW DM26
0056 NW6O DM26
0124 W7RV DM35
0126 N5JEH -
0127 K5AM DM54
0131 N6CA -
0135 WB8VLC DM34
0138 N6KK DM03
0140 N5JHV DM62

0141 K7JA DM03
0142 W6KK DM14
0143 KH7L -
0144 K6SYW DM03
0149 N0XX CN84
0152 WA6PEV DM15
0153 K6QXY -
0208 N2KK DM04
0210 W6BYA -
0211 W6QUV -
0212 W6SYW -
0213 W7EW CN84
0216 WX7R CN85
0217 N7CW DM12
0218 N6JV CM98
0218 W6WVK CM88
0219 N6KBX CM98
0220 K6MYC DM06
0222 AB6PY CM88
0224 K7RAT CN85
0229 W16Z CN84
0231 NF6L DM13
0233 KJ6HI DM08
0235 W7GE CM98
0236 KC6IPF CN80
0243 N6BZY DM12
0253 XE2EED DM12
0258 WB6AAG CM95
0300 K7KX CM96
0306 N6XQ -
0313 HL5XF -
0328 XE2EED -
0332 XE2XC CM12
0350 N6XQ -

19/10

0113 K6QXY -
0118 K7JH DN44
0119 N9JIM CM87
0120 WA6KLK CM89
0121 W6QUV CM98
0125 WA6ETB CM87
0128 WD6HDY CM89
0131 K6FV CM87
0132 K6LLQ CM97
0134 W6JWM CM97
0138 AB6PY CM88
0139 K6UM -
0141 K6HEW CM98
0143 K6FEE CM98
0146 W4LZP -
0149 K7YVZ DN13
0158 K6PXT CM87
0200 K6MI -
0205 W6BYA -
0207 W6JRY CM99
0210 W6WVK CM88
0214 W6RD CM97
0215 K6QXY -
0216 AA1Z CM88
0219 AB6PY -
0223 W6QUV -
0224 WD6HDY -
0255 AB6PY -
0257 W6QUV -
0300 N6KBX CM98

For a change of scenery John VK4FNQ worked the following: 23/10 1236 JY9NX 4x1/5x2 1249 S21YU 4x1/4x8

24/10

0855 SVIUN 5x9/5x9 KM18
0857 SV1DH 4x1/5x5 KM27
0859 SV1OE 5x1/5x5
0901 IT9RZR 4x1/5x5
0933 VR2XMT 4x1/5x5
0942 SV5BYR 4x1/5x5
0944 SV5AZP 4x1/5x5

28/10

0943 HB9QQ 5x5/5x8 JN47
0947 IK5YZW 5x2/5x5 JN53
0949 IK2DRY 5x1/5x5 JN64
0951 F4PAN 5x5/5x7 JN26
0953 DK7SP 5x1/5x6 JN48
0954 SQ8GKA 4x1/5x5 K7??
0955 IK1IZB 5x1/5x5 JN45
1001 IK5YJY 5x1/5x5 JN53
1004 IZ5EME 5x1/5x5 JN52
1006 F5LNU 5x2/5x2 JN04
31/10

0831 P2UKFS
0832 YU7FU KN04
0839 YO4AUL KN44
0906 YO7VS KN14
0912 9A3AQ JN75
0915 F5JJK IN87
0916 9A4CD JN75
0921 JA6RUP
0923 IK3TPP JN65
0924 IK1IEG JN35
0927 IK3OCD JN65
0928 I3LLH JN65

Frequencies used were 50.110, 50.115 and 50.120. Obviously the EU stations still don't go far away from 50.110.

Equipment used was a Yaesu FT 847 100w to a 9 element H/B yagi on a 30 foot boom up 62 feet. Grid square QG39EX. I am approx. 1150 feet above sea level and about 60 miles inland from the coast and south west of Townsville, and 7 miles outside Charters Towers on the main highway from Townsville to Mount Isa.

From the above, it seems next February/March should provide contacts to Europe. After that, will it be too late?

Ron VK4BRG said: I missed the Monday opening being away re-installing a local 2m repeater. On Tuesday 19/10 the band opened for me at 0122 with KC7IJ in Idaho DN44 ... actually the border area between Idaho, Wyoming and Montana. Worked 18 stations mostly North California area.

Conditions dropped considerably around 0200, but interestingly, marginal conditions existed for another hour with the same KC7IJ being audible most of that time. Did also work a couple of stations in Montana and North Ca. during that hour. Other stations I heard participating this end were VK4s FNQ, JH, DO, BLK.

Further to the Monday 6m opening .. and, vaguely along the the current theme of horizontal omni antennae, I had a report of my VK4BRG 6m beacon being heard by W6QUV in CM98 at 0153 at S5. The VK4BRG beacon, 50.0775 MHz, is solar powered and about 3 watts into a turnstile antenna. It was heard in Colorado last cycle. Helps when propagation is "on side"! The following stations were worked: 19/10: 0122 KC7IJ DN44; 0136 K7YVZ DN13; 0138 WA6ZFK CM99; 0139 W6QUV CM99; 0141 N6JV CM98; 0141 W7GE CM98; 0142 K6QXY; 0144 AB6PY CM88; 0146 K6UM CM88; 0147 WD6HDY CM89; 0148 WA6KLK CM89; 0149 K6HEW CM98; 0151 W6JRY CM95?; 0153 W6QUV called, reported copying VK4BRG beacon S5; 0153 K6KLY CM87; 0155 K6PX CM87; 0157 W6BYA; 0201 K6MI DN06; 0235 W7GJ DN27; 0259 WD6HDY CM89.

As noted, initial station, KC7IJ heard plus chit chat between us from 0122 to about 0230 ... just seemed to be a pipe line between us.

23/10: YJ8UU into here most of the morning .. he worked a few W5s plus XE1BEF, but did a lot of calling in between. Had KH6 this morning ... again now at 0640. KH6s have reported activity from FO, A35, 3D2, AH8 and of course YJ8.

Dick KH4/W4ZYV, on Midway Island, has had good signals into this QTH for the last few days, particularly yesterday (25/10) afternoon. Heard him work heaps of VK4s plus VK2, ZL and FK. For those who need his QSL info, simply: Dick, W4ZYV, PO Box 444, Alva, FL. 33920.

Had a weak (one could say, CW type!) opening into Central Ca on 26/10 across to Nevada from 0227 to 0323. The guys around the Townsville area have worked Bangladesh, Jordan, Cyprus and Italy over the last couple of days. ... Ron VK4BRG.

Repeater news

Steve VK2KFJ reports a new six metre repeater on 53.625 MHz has come on air with 25 watts. It is located about 20 km south west of Caboolture on the Queensland Sunshine Coast and uses the same frequency as VK2RSN at Newcastle. At present the callsign is unknown.

The VK2RMB 53.675 repeater in north east Sydney is back on air. The receiver was dead and antenna damaged in a storm last year, both have been repaired. The VK2RWI 53.850 repeater in north west Sydney is nearing completion.

Tony VK3JED reports that the VK3RMS 53.900 repeater in Melbourne has regular nighttime scheds operating it.

Six metre repeater updates can be found at <http://www.qsl.net/vk2kfj/6m_rptr.html> ... Steve VK2KFJ

New beacon

Via APCNews, Tony VK3CAT advises of a new two metre beacon near Moe, with the callsign VK3RGI. It transmits on 144.533 MHz running 10 watts to a halo.

Wally VK6KZ reports that after some tests with the Esperance beacon on his visit to Bill VK6AS, he discovered a major fault in the antenna - like about 20 mm of inner of coax acting as the major radiating element - the cockatoos are really hungry and had removed the insulation around the joint and half the dipole had somewhat sagged. A "you-beaut bend dipole" originally built for Esperance dispatched post-haste to Bill.

Two metres

Chris VK6BIK sends a report from Bill VK6AS in Esperance of a very strong tropo opening across The Great Australian Bight occurring on 25 and 26 September, at least one month earlier than usual. Bill runs full legal power into an 8 bay x 16 element long-boom 144 MHz antenna system, comprising 128 elements in all.

The opening first became apparent at about 1020, when Bill heard the Mount Lofty and Mount Gambier beacons, both at S9+. He called CQ on 144.100 for 45 mins, before being compelled to use the landline to alert possible eastern states contacts to the propagation phenomenon.

Bill proceeded to work Trevor VK5NC, Roger VK5NY, David VK5KK, Colin VK5DK, Russell VK3ZQB, all 5x9+. Of note is that VK5KK "repeated" Bill to VK5AKM on 10 GHz for an interesting cross-band contact. Bill also gave one station a 5x9 report on just one watt! The opening lasted at least until 1340 when Bill pulled the switch. The following morning, the propagation was still there, although at reduced strength. About 2300, Bill worked VK3ZL on CW at 529, and then VK5DK 5x9. In the meantime the beacons had dropped to S2-S3, peaking S5. At no time were any VK6 beacons heard.

Aurora propagation

Max VK3TMP reported the aurora on 22/10 and on two metres from 0658 to 0730 worked: VK2KU 5x6 to 5x9, unusually good audio for an aurora; VK2EK 5x5; VK2TWR 5x5 was heard for 20 minutes after everyone else disappeared; VK3DUT, VK3ZQB 5x9; VK3BWT 5x3; VK1VP 5x6; VK5LP 5x2 lots of phase distortion and Doppler shift.

Guy VK2KU: The opening lasted from 0655 to at least 0730. No VK5s or VK7s were heard, nor VK1s, though I know VK1VP and VK5LP were active. Rod VK2TWR and Warren VK3BWT were quite weak.

Outstanding signals were VK3TMP in Somerville and VK3ZQB in Port Fairy, both with good enough audio quality for some kind of real conversation. Contacts made were limited more by available stations than length of the opening. Worked: VK3ZQB, VK3TMP, VK3DUT, VK3XQ, VK3KEG, VK2TWR.

Eric VK5LP worked Russell VK3ZQB and Max VK3TMP both 4x6A. Called VK1VP but no reply.

Correction

In the October issue under the title of "New 144 MHz world record" I mentioned at the end that the Australian record is held by VK4BFO and J17DMB. Mike VK4BFO has drawn my attention to the correct callsign as being his, and not VK4BFO, and made when he lived at Mount Isa. Sorry about that error.

WIA Victoria George Bass Diploma

Jim Linton VK3PC has asked me to mention the above Diploma in these notes.

As part of a program to encourage more simplex operation on VHF/UHF, a new award called the WIA Victoria George Bass Diploma is available for contacts across Bass Strait.

All operation must meet the diploma rules and comply with WIA Band Plans. Disqualification may occur for using FM in a SSB band segment, or prolonged operation on DX calling frequencies.

The rules are simple:

Operation must be two-way simplex telephony contacts across Bass Strait, between 1 November 1999 and 30 April 2000.

Only FM or SSB modes are permitted on the 6-metre, 2-metre and 70-centimetre bands.

Mainland stations must work five VK7 stations on a single band.

VK7 stations require 20 mainland contacts on a single band.

SSBs are issued for single mode (FM or SSB) only.

Only one callsign may be used by each radio amateur (no multiple callsigns).

To obtain a diploma, send a signed copy of a log of contacts, plus \$5 to: WIA Victoria George Bass Diploma, 40G Victory Boulevard, Ashburton, Victoria, 3147. Claims received more than one month after the diploma period will not be accepted.

Note: The WIA Victoria web site <www.tbsa.com.au/~wivic> will from 1 November also include VHF/UHF operating tips for newcomers, discussing band plans, antenna polarisation and trans-Bass Strait propagation. It is also going to promote participation in the Spring Field Day and Ross Hull Contest.

... Now over to David VK5KK

Activity at the "Right" time

Just how many people are active on the VHF/UHF Bands, who are they, where are they? There would seem to be a lot of Amateur Operators with some general interest, but only a small percentage able to be active at any given time. Anomalous propagation drives our "DX" activity yet just who is at the other end of the path to actually work? Just how many openings are missed because the band is open to nowhere? By nowhere I mean where there is no activity or, worse still, where there is activity but no one on at the right time.

It's a fact that the hit and miss nature means that it is more good luck than good management that some of the harder paths are actually worked. Some may argue that this is all part of the fun. But for some propagation modes, where propagation may only occur once every few years, chances have to be maximized! Beacons provide a pseudo "active station" so a path can be monitored, but few beacons give out QSL cards or count for distance records!

To get better results, individuals have banded together into groups to communicate via various means between times of propagation. Columns like this have promoted, over a long period of time, those who are active in various areas so others can establish contact. Some groups have regular scheds during high probability periods, e.g Meteor Scatter, Aircraft Scatter, etc. Others keep regular contact on another band, Email or in some cases even HF! Instantaneous communications have been mostly restricted to panicked phone calls or a shout over the local repeater to get some extra activity!

Email has become an efficient means of rapid broad communications over a non-geographic area for many activities, including amateur radio. The existence of Email reflectors has proven to be a useful tool to boost activity. In addition to Email another Internet based system has also developed, the "DX Cluster".

A DX Cluster is an Internet "Notice" board, updated in real-time by participants connected to that cluster. The Cluster operates a bit like the panicked call on the local repeater, except the geographics and recipients have been delimited.

Each Cluster has a title interest. This may be as broad or as narrow as activity dictates, e.g a VHF Cluster or a more specific group like a 10 GHz Cluster. Those contributing to the cluster, input information about activity or propagation specific to that Cluster. Information updates within seconds as messages are usually not subject to an

intermediate clearance point. You may access multiple Clusters by opening multiple windows in your web browser.

In Europe and the US, DX Clusters have gone from strength to strength in the last few years. Recent visitors to Europe/UK, in particular, have reported the number and speed (within minutes!) at which stations appear during an opening, once the information is available on a DX Cluster. The only down side of using a cluster as a real-time indicator, is the time you are prepared to be connected to the Internet. If you only connect for a short time per day, a lot of what you will read on a cluster will already be history!

In Australia, we have a little way to go. Again our populous and demographic sparsity are our limiting factors. I suspect that beneath the VHF Reflector(s) level we do have some Cluster type activity but of a limited type. Australia is rapidly progressing to a point where households will have affordable "time independent" data connections making Internet access cheap enough for this type of activity. So part of the reason of writing this section is to uncover any "Clusters" and promote this into a more broad area of users. On this subject it is very much "Over to you".

With this segment, as with the previous two, the common theme has been that of promoting activity. As I write, the October segment has generated a reasonable amount of feedback from those who have already dabbled in APRS & PSK31. Through this medium, I hope to publish "how to contact" other amateurs experimenting in the various areas covered.

Correspondence for the column can be forwarded to me as follows. On email <tecknolt@arcom.com.au> or Telephone 0414 808060 between 2000-2200 EST or via Snail mail to P.O. Box 789 Salisbury, SA, 5108. As I spend an amount of time outside of South Australia, Email is probably the most reliable method followed by the Mobile phone to get in touch. The deadline for each month is the 3rd day of the month prior.

On a more general note, this column marks the end of an era, in more ways than one. Firstly, this is the last column in this millenium. More importantly, this is Eric's last column. We all have enjoyed Eric's journalism in these columns over a generation. A style that has both congratulated and thrown brick bats as required! While I have been involved in the preparation of some of the columns since 1982, the size of shoes to be filled from January 2000 is not to be underestimated! I am in the negotiation stage with Eric to maintain his input in one or two areas. More next month, till then happy New Year!

All things must come to an end ...

That's it! The last of my notes for these columns after 30 years and one month. In the January issue there will be a special article which looks back at my lifetime in wireless/radio/electronics.

Writing for so long the monthly preparation of VHF notes have been an important part of my life. Taking an overall view it has been an interesting experience and one which has brought to me a wide circle of friends and correspondents from all over Australia and other parts of the world. A pleasing experience knowing you all even if only from the written word, the phone calls and more recent times the e-mails.

Fearful that I will miss someone I don't propose mentioning too many of the long list of amateurs who have contributed information over the years, I am very grateful to you for your support. However, there are a few who stand out for the continuity of their contributions. These include John VK4KK who often telephones news of contacts as soon as they have happened, Ron VK4BRG, John VK4FNQ, Ray VK4BLK and Wally VK4DO; Mike VK2FLR; Geoff VK3AMK, Gil VK3AUI, Russell VK3ZQB and Steve VK3OT; Wally VK6KZ, Don VK6HK, Graham VK6RO;

David VK5KK and more recently David Vitek for a long list of hand-written SWL info covering 30 to 150 MHz. Then there are many who have responded with detailed information when I have requested it of them - thank you. I apologise if I should have mentioned someone and have not done so.

A gratis copy of The West Australian VHF Group News Bulletin has been arriving on my desk each month for so many years that I have lost count. Another regular has been the Newsletter from the Geelong Amateur Radio Club. Thanks folks for thinking of me.

Sharing my notes with others, particularly with overseas correspondents, has been one of the highlights. One of the longest standing contacts has been with the conductors of *The World above 50 MHz* published in *QST*. For many years we have shared columns, first with Bill Tynan W3XO now W3XO/5 and then Emil Pocock W3EP. Both have been truly great correspondents and I am truly indebted to them for the friendship extended and the information that they have supplied for so long. Believe me, much more happens in the Northern Hemisphere than down here and they have kept me informed. Of more recent times, the receipt of *Six News* from the UK Six Metre Group has been a source of good reading.

I must also include Ted Collins G4UPS for the years of faithfully arriving pages of contacts and other information from the UK. I learnt much of the European perspective from Ted's writings. Ted doesn't have e-mail so we have each month swapped notes by air mail.

I cannot close without saying how well I have been treated by the Publications Committee of *Amateur Radio*, who appear to have accepted my notes without resorting too heavily to the blue pen to shorten or change them - not to my immediate knowledge anyway! I enjoyed a long association with Bill Roper VK3BR who received my monthly notes for many years. I think Bill Rice VK3ABP has looked after me rather well too, as have June Fox in the office and Brenda Edmonds VK3KT. More recently I have built up a good rapport with Bob Harper VK4KNH who has taken the place of Bill Roper in the preparation of information for publication.

So, it has to be with more than a tinge of regret that I now put aside the keyboard and turn my writings to other directions. If my health continues to allow me, then you may read some further contributions from me in the future. Thank you one and all for a great 30 years of sharing experiences, something I will remember and cherish for the remainder of my life.

As the result of these writings, if down the track I should be remembered in any way it would be that for me having given of my best for the good of my friends, the amateur radio operators, the amateur radio movement in general and VHF/UHF in particular. The information listed in these notes now provides a lasting record of how the VHF/UHF scene has unfolded with the passage of time. I am proud to have been part of it.

I now leave the helm to David VK5KK, a close friend of many years, and one who provided fill-in columns when I was indisposed and confined to hospital, whom I see as a very worthy successor to my writings. I wish him well for the future and hope that the support given to me will be forthcoming to David. Cheers all.

Closing with two final thoughts for the month:

1. While it may be true that a watched pot never boils, the one you don't keep an eye on can make an awful mess of your stove, and
2. Anyone can become angry. That is easy. But to be angry with the right person, to the right degree, at the right time, for the right purpose and in the right way - that is not easy!

73 from The Voice by the Lake - for the last time.

ar

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REPEATER LINK

Will McGhie VK6UU

21 Waterloo Cr Lesmurdie 6076

will2@omen.net.au VK6UU@VK6BBR

Time

Finding the time to write this regular column is becoming more and more difficult but I would like to keep it going. One way around the time problem is to make the column shorter and even miss the odd month from time to time. There is a need for some focus on voice repeaters in Australia and perhaps this column has contributed. So with limited time a couple of topics for this month.

LIPDS

Rarely out of amateur radio news these days are LIPDS. An interesting event happened of recent, when the ACA rang me to say that one of our repeater sites was radiating the Royal Flying Doctor Service from HF onto 152.025 MHz, a LIPD frequency. It turned out an experiment to find out what this site would be like on HF was being conducted from this amateur repeater site. Without going into the detail, what was of interest was the ACA's initial comment to me. "We find it hard to believe that the LIPD is only radiating 100 mW, as it is S5 in Perth city." The distance is about 20 kilometres from our repeater site to the ACA monitoring position. LIPDS on this frequency can radiate up to 100 mW, effective isotropic power.

The ACA visited the site and found the LIPD was transmitting 70 mW. This 70 mW was fed via a 3dB coax loss into a 2dB gain dipole over an isotropic radiator. This equates to about 50 mW effective radiated power. A bit of a smile on my face as the ACA discovered that 50 mW can go a long way.

More LIPDS

In my work situation working in the RF and microwave area of the ABC, I get interesting requests from time to time, and this one involved using LIPDS.

In the television production area a program is under ongoing production that involves several stand-alone cameras. This type of production is very simple and does not involve the complex outside broadcast vehicle but just several cameras. Each camera records the same picture but from different positions. The pictures are then returned to the editing suite and a final program is produced. What is important is the timing of each camera, as each camera has what is called time code. This is a frame by frame number (25 per second) in order to make editing possible. Each tape from each camera can then be synchronised to within one twenty fifth of a second and precise editing done. The problem is how to make sure all cameras remain locked together with time code.

Cables can be run to each camera but this is often difficult. The solution is to radiate the time code on a radio frequency and a lightweight radio receiver picks up the time code and it is fed into the camera. All cameras have their own receiver and all cameras now have the same time code so they all have the exact same frame by frame time code information. The use of a LIPD frequency makes this easy.

No licence is required and low power is all that is required as the cameras are at the most 100 metres apart. The problem for me is what LIPD frequency, particularly in terms of what cheap lightweight equipment is available? To me it brings home the point that there are more uses for LIPD operation than you can imagine. Uses that have a genuine need for spectrum. The difficult decision is, what spectrum? Our 70cm band is one slice of spectrum that is under threat and just how to co-exist is of utmost importance.

FTAC (John Martin) has prepared a well thought out paper on what options we may or may not have, and it is under discussion. One important point John makes is that LIPD operation is here to stay, so we best get on with finding solutions that don't include removing LIPD operation from 70cm, and I agree. More on what we can and cannot do in regards to our 70cm repeater segment and living with LIPDS next month, time permitting.

This article took only one hour to write, edit, spell check and email to AR magazine, rather than the 4 to 8 hours it often takes. When you need to work fast you can. I just hope it is of some readability and interest to you, the reader.

ar

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AWARDS

John Kelleher VK3DP

Federal Awards Officer

4 Brook Crescent, Box Hill South, Vic 3128 (03) 9889 8393

I have had frequent enquiries about CQ Magazine Awards. Apart from those who are subscribers to this magazine, little has been said about the awards available to radio amateurs world-wide. Here is a list of the awards...

Single band WAZ (Worked all CQ Zones)

5 Band WAZ

WARC Bands WAZ

RTTY WAZ

WNZ (Worked all Novice Zones)

160 Metre WAZ

Satellite WAZ

WPX (Worked all Prefixes)

CQ DX Award

All applications for WAZ should be sent to :-

The WAZ Manager

Jim Dionne K1MEM

31 DeMarco Road

Sudbury MA 01776.

Should you find this method unappealing, then you may wish to send your applications through me, or one of the following representatives here in VK land :- VK4LC, VK3AKK, or VK5IE, all QTHR.

The CQ application form 1479 should be used, which is available through myself, or one of the above members.

I still receive applications and upgrades for DXCC in an incorrect form.

Please send your correspondence as such strictly in alphabetical order of prefix. Without your help in this regard, it takes me four times as long to copy or transcribe your

listings to the DXCC database.

Poland : Polski Związek Krotkofalowcow (PZK) Series.

General requirements. Awards are available to licensed amateurs or SWLs. Fees for each award are DM10, US\$7 or 10 Irc. All contacts, with the exception of Satellite or repeaters, regardless of band or mode, are valid for these awards. You must possess all necessary QSLs but GCR rule applies.

Apply to :-

PZK Awards Manager

Augustyn Wawrzyniak SP6BOW

PO Box 61

PL-64-100 Leszno 1 Poland.

All Countries of the 15th Zone (AC 15 Z)

Contact at least 23 countries/call areas located in CQ Zone 15 as follows :-

Aland Island OH0

Albania ZA

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Bosnia T9

Corsica TK

Czech Rep. OK

Estonia ES

Finland OH 3 call areas

Hungary HA

Italy I

Kaliningradsk UA2

Latvia YL

Lithuania LY

Macedonia Z3

Malta 9H

Market Reef OJ0

Poland SP 4 call areas

San Marino T7

Sardinia IS

Sicily IT9

Slovak Rep. OM

Slovenia S5

Vatican City HV

Yugoslavia YU 4 call areas

The contacts with 4 call areas of Poland are mandatory. Contacts since 1 Jan 55

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All 49 provinces. Class 2 - 35, and Class 3 - 20. When applying for a higher class,

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BK Bialystok SP4

BP Biala Podlaska SP8

BY Bydgoszcz SP2

CH Chelm SP8

CI Ciecianow SP5

CZ Czestochowa SP9

EL Elblag SP2

GD Gdansk SP2

GO Gorzow SP3

JG Jelenia Gora SP6

KA Katowice SP9

KI Kielce SP7

KL Kalisz SP3

KN Konin SP3

KO Koszalin SP1

KR Krakow SP9

KS Krosno SP8

LD Lodz SP7

LE Leszno SP3

LG Legnica SP6

LO Lomza SP4

LU Lublin SP8

NS Nowy Sacz SP9

OL Olsztyn SP4

OP Opole SP6

OS Ostroleda SP5

PI Pila SP3

PL Plock SP5

PO Poznan SP3

PR Przemysl SP8

PT Piotrow Tryb SP7

RA Radom SP7

RZ Rzeszow SP8

SE Siedlce SP5

SI Sieradz SP7

SK Skiermiewice SP7

SL Slupsk SP1

SU Suwalki SP4

SZ Szczecin SP1

TA Tarnow SP9

TG Tarnobrzeg SP7

TO Torun SP2

WA Warszawa SP5

WB Walbrzych SP6

WL Wloclawek SP2

WR Wroclaw SP6

ZA Zamosc SP8

ZG Zielona Gora SP3

Applicants are asked to give the abbreviations denoting provinces in alphabetical order.

W-21-M Work 21st Meridian

Issued for contacts with at least 16 countries located on the 21 east meridian.

QSO with Poland is mandatory. Contacts since Jan 1 1955. Countries list is :-

Aland Island OH0

Angola D2

WIA Awards are free to members.

Have you got yours?



Botswana A2
 C.Afr.Republic TL8
 Chad TT8
 Czech.Republic OK
 Estonia ES
 Finland OH
 Greece SV
 Hungary HA
 Kaliningradsk UA2
 Albania ZA
 Macedonia Z3
 Latvia YL
 Libya SA
 Lithuania LY
 Namibia V5
 Norway LA
 Poland SP5
 Rep. Of S.Africa ZS2-6
 Rep. Of Zaire 9Q
 Romania YO
 Slovak Rep. OM
 Svalbard JW
 Sweden SM
 Yugoslavia YU

DX News

Marcel, ON4QM is presently active as FO0DEH from the AUSTRAL Islands.

FT5X/FR5HR QSLs are being rejected by the DXCC Desk.

VQ9- Chagos Islands.

Ron, AA5DX will be QRV until end of January 2000.

Jukka, OH2BR will be active on Pitcairn Island in January 2000.

9U - Burundi. Ragge, SM5DIC will be signing 9USD until Christmas.

Abdollah,

EP2PM is QRV from Iran around 0400z using SSB on 14186 Khz.

Various operators will be using special prefix 3F until Jan 5 2000, to commemorate the acquiring of the Panama Canal. QSL via HPIAC.

Another group of operators will activate IOTA SA-05, Juan Fernandez Island between January 6-16 2000.

Until December 31, some Philippine amateurs will be using prefix DU67 to celebrate the 67th anniversary of the Philippine Amateur Radio Association.

Antarctica.

EM1KGG can be heard from the Vernadsky base on Galindez Island IOTA - AN-006. QSL via UT7UA.

Denis, VE2DPS will be active until December 22 from 3XY Guinea, his antenna is a G5RV. QSL to home call.

Best Regards, and good hunting.

73 de John, VK3DP.

ar

POUNDING BRASS

S P Smith VK2SPS

9 Peak Street, Bateau Bay NSW 2261
02 4334 7743

Merry Christmas to everyone and a very big thank you for your continued support and interest in this column, by the number of letters and phone calls received lately there is still great interest in telegraphy, once again thank you very much.

In a recent article in QST Magazine Vibroplex Company has recently reintroduced the Blue Racer and given it the name of "Millennium bug" or the "Blue Racer 2000".

The Millennium Bug sells for US\$179.95 (standard) which has a blue base and the deluxe model with Chrome base for US \$219.95.

The Company President is S. Felton (Mitch) Mitchell, W4OA. Mitch took over the company in 1994 and is the first radio amateur to do so. Mitch is re-introducing some of the old Vibroplex classics to his range of Bugs and Paddles and should be on sale early next year.

Further inquiries can be made to the following address: The Vibroplex Co. Inc. 11 Midtown Park Mobile AL. USA 36606

Turning to collectors of telegraphic paraphernalia, I've recently come across two very interesting books which are as follows.

Perera's Telegraph Collectors Guide 2nd Edition by Tom Perera. WITP

Tom Perera has over 45 years collecting and trading experience and would have to be Americas most authoritative expert in this field today.

This book would make an excellent reference guide to all collectors worldwide and to historians.

The book covers such things as, advice on buying keys, adjustments, restoring old keys, manufacturer codes plus historical background on all keys.

Further information can be obtained from the following web site.

<<http://w1tp.com>>

The last book looked at was - A History of the GPO Mark 1,2 and 3 Morse Telegraph Keys. By Dennis Coacher G3LLZ

The book covers such subject's as:

- 1) Manufacturers Codes
- 2) Construction Details
- 3) Technical Drawings
- 4) Key Maintenance

I highly recommend this book to collectors of GPO Type Series Keys.

Until next month a very warm and Happy Christmas and to the new millennium 2000, a very safe and joyous New Year.

See you next year,

ar

FROM:

Asimov, Isaac

(1920-1992) b. Petrovichi, Russia.

SNIPPITS

At two-tenths the speed of light, dust and atoms might not do significant damage even in a voyage of 40 years, but the faster you go, the worse it is—space begins to become abrasive. When you begin to approach the speed of light, hydrogen atoms become cosmic-ray particles, and they will fry the crew. ...So 60,000 kilometers per second may be the *practical* speed limit for space travel.

Isaac Asimov, *Sail On! Sail On! In The Relativity of Wrong*, Kensington Books, New York, 1996, p 220.

CONTESTS

Ian Godsill VK3DID,
57 Nepean Highway, Aspendale, 3195

Contest Calendar December 1999 - February 2000

Dec 3/5	ARRL 160 Metres Contest	(CW)	(Nov 99)
Dec 4/5	EA DX Contest	(CW)	
Dec 11/12	ARRL 10 Metres Contest	(CW/SSB)	(Nov 99)
Dec 18	OK DX RTTY Contest		(Nov 99)
Dec 18/19	Croatian CW Contest		
Dec 18/19	International Naval Contest	(CW/SSB)	
Dec 19	RAC Canada Winter Contest	(CW/SSB)	
Dec 25/26	Original QRP Contest	(CW)	
Dec 25/26	Stew Perry Topband Distance Challenge	(CW)	(Nov 99)
Dec 26	Ross Hull Memorial VHF-UHF Contest	(CW/SSB)	
Jan 11			(Oct 99)
Jan 1/2	Original QRP Contest		
Jan 7-9	Japan International Low Band DX Contest	(CW)	(Dec 99)
Jan 8/9	Summer VHF-UHF Field Day Contest	(CW/SSB)	(Dec 99)
Jan 11	Ross Hull Contest - Final Day		
Jan 16	HA DX CW Contest		
Jan 28-30	CQ WW 160m DX Contest	(CW)	
Jan 29/30	REF CW Contest		(Dec 99)
Feb 5/6	Ten-Ten Winter Party	(SSB)	
Feb 12/13	WW RTTY WPX Contest		
Feb 12	Asia-Pacific Spint (CW)		
Feb 19/20	ARRL International DX Contest	(CW)	
Feb 26/27	RSGB 7 MHz Contest	(CW)	
Feb 26/27	REF SSB Contest	(Dec 99)	
Feb 27	High Speed Club CW Contest		
Thanks this month to REF VK3KWA			

By now you will have seen the results of this year's Remembrance Day Contest. It was most pleasing to see them published so promptly after the event, so our sincere thanks go to Alek VK6APK for his efficient management.

As a VK3 I was delighted to see the improvement in the Division's score, but sorry that the "whipping up" that went on prior to the Contest did not quite achieve the winner's place.

There are always some who are not happy with aspects of a contest, particularly a big one like the RD. There is often room for improvement and your comments are always welcome. Certainly there may need to be an adjustment to one section of the Rules for next year - see comments below.

I have spoken to several people about the scoring formula. On the surface it seems inordinately complex. However, with a country as diverse as Australia, it really is most difficult to find a formula that is unbiased to everyone in all circumstances. Despite claims that the present formula "was devised by a VK3 to prevent VK3 winning" - a claim that I find extraordinary - it does seem that this formula affords the

best balance for everyone (quite apart from a personal preference that far more emphasis should be given to CW!).

1999, however, threw up one aspect with which I was most unhappy, viz the use by a group of VK3s of programs for fully automated, unattended QSOs in Packet mode. My concerns are:

- (1) Packet currently falls under the CW section, which it is not.
- (2) The operators of this mode did not submit Exchanges in accordance with the Rules for CW section, ie a three-digit format. Instead, their program allowed for only a two-digit style. Either the Contest Manager or I would have been quite justified in removing the logs from consideration on this ground alone.
- (3) While I agree with the Amateurs' Code that we should all be working to keep abreast of technology, I do not see that contesting has come to the stage where unattended operations can be said to be "within the Spirit of the Contest". There is no challenge or sense of achievement in just switching on a

machine, then walking away while it does the work for you!

From this I deduce that

- (a) if there are operators who want this style of contest, then please present your ideas and we can organise something for you;
- (b) if you would like a section for this style of operation in next year's RD, so be it. We can amend the rules to make it legal, even if The Spirit may still be open to debate.

Finally, I draw your attention to the fact that all WIA Co-ordinator positions fall vacant at the May AGM and applications should be received at Federal Office by February.

If anyone would like to apply for Contest Co-ordinator, here is a Job Specification for your consideration —

Federal Contest Co-ordinator — Job Specification

Applicants for the position of Federal Contest Co-ordinator are asked to consider the following guidelines>

1. report frequently to the member of the Federal Executive appointed to oversee Contest activity and to keep him fully informed, especially of budgetary costs;
2. liaise frequently with the Federal Office;
3. write an Annual Report in February each year for presentation at the WIA's Annual General Meeting;
4. liaise closely with the NZART Contest Co-ordinator;
5. liaise closely with other Contest Co-ordinators and Managers, both in Oceania and world wide;
6. produce a monthly information column in "Amateur Radio";
7. organise for production and forwarding of trophies at various times each year as appropriate;
8. keep accurate records of trophy winners and to arrange for engraving of Perpetual Trophies;
9. oversee the supplies of available certificates and to organise replacements when necessary;
10. write and post certificates on behalf of individual Contest Managers;
11. arrange a speaker for the annual Remembrance Day Contest and to produce and distribute tapes of the speech for each Division;
12. be available via telephone, postal mail and e-mail.

Spring VHF-UHF Field Day

Rule Clarification

The rules for the Spring VHF-UHF Field Day were published on page 48 of October "AR". The second rule under the heading "General Rules" needs clarification. The rule is: "Operators of stations in Section C may not make contest exchanges using their own call signs".

This is fine for operators of club stations, using the club's call sign rather than their own, but it doesn't quite work with non-club stations that use the call sign of one of their operators. Under the above wording, the amateur whose call sign was being used would be prohibited from operating himself! So the wording of this rule should be changed to: "Operators of stations in Section C may not make contest exchanges using call signs other than the club or group call sign."

Summer VHF-UHF Field Day 2000

John Martin (VK3KWA), Contest Manager

15 - 16 January, 2000 0100z Sat - 0100z Sun

The contest rules are the same as for the 1999 Spring Field Day. Please note the couple of minor changes that were discussed in more detail on page 48 of October 1999 "Amateur Radio".

The next Field Day should provide plenty of opportunities. It will take place over the last weekend of the Ross Hull Contest, so there will be extra home stations there to work. And if you live in Tasmania or anywhere within reach of it, remember that any Field Day contacts can be counted for the new George Bass Diploma offered by VIA Victoria.

I would like to briefly repeat my request to club stations for the names and call signs of operators, printed legibly so that I can read them!

Duration

VK6 only: 0400 UTC Saturday, 15 January to 0400 UTC Sunday, 16 January, 2000. All other call areas: 0100 UTC Saturday to 0100 UTC Sunday.

Sections

- A: Portable station, single operator, 24 hours.
 - B: Portable station, single operator, any 6 consecutive hours.
 - C: Portable station, multiple operator, 24 hours.
 - D: Home station, 24 hours.
- Single operator stations may enter both

Section A and Section B. If the winner of Section A has also entered Section B, his/her log will be excluded from Section B.

If two operators set up a joint station, they may enter Section C under a single call sign, or sections A/B under separate call signs. Stations with more than two operators must enter Section C.

General Rules

One call sign per station. Operators of stations in Section C may not make contest exchanges using call signs other than the club or group call sign. Operation may be from any location, or from more than one location. You may work stations within your own locator square. A station is portable only if its equipment, including antennas, is transported to a location other than the normal home location of its operator. Repeater, satellite and crossband contacts are not permitted. No contest operation is allowed below 50.150 MHz. Recognised DX calling frequencies must not be used for any contest activity. Suggested procedure is to call on .150 on each band, and QSY up.

Exchange RS (or RST), serial number and your four digit Maidenhead locator.

Repeat Contacts

Stations may be worked again on each band after three hours. If the station is moved to a new locator square, repeat contacts may be made immediately. If the station moves back into the previous locator square, the three hour limit still applies to stations worked from that square.

Scoring

For each band, score 10 points for each square in which your station operates, plus 10 points for each locator square worked, plus 1 point per contact. Multiply the total by the band multiplier as follows:

6m 2m 70cm 23cm Higher

x1 x3 x5 x8 x10

Then total the scores for all bands.

Sample Scoring Table

Band QSO Points Locator Points

Multipier Total

6m 100 + 200 x 1 = 300

2m 60 + 120 x 3 = 540

etc. —

Overall Total 840

Logs

For each contact: UTC time, frequency, station worked, serial numbers and locator numbers exchanged, points claimed. The front sheet should contain the names and call signs of all operators, postal address, station location and Maidenhead locator.

The section entered, a scoring table and a signed declaration that the Contest Manager's decision will be accepted as final.

Deadline

Logs must be received by Monday, February 14, 2000. Early logs would be appreciated. Logs may be posted to: WIA VHF-UHF Field Day Manager, 3 Vernal Avenue, Mitcham, VIC 3132. Logs may also be e-mailed (in ASCII text form ONLY) to <jmartin@xcel.net.au>

Japan International DX Contest

LF CW: 2200z 7 Jan - 2200z 9 Jan 2000

HF CW: 2300z 7 Apr - 2300z 9 Apr 2000

PHONE: 2300z 10 Nov - 2300z 12 Nov 2000

OBJECT is to work as many JA stations and JDI islands as possible.

BANDS: LF CW 160/80/40; HF CW 20/15/10; Phone 80 - 10 (no WARC). CATEGORIES: Single operator, single/multi-band high power (more than 100w c/p), single operator, single/multi-band, low power (less than 100w c/p), multi-operator and maritime mobile.

General

Operate for maximum of 30 hours only and show rest periods in log; single op must perform all tasks himself; multi-op must remain on band for at least 10 minutes and during this time multi-op may transmit on another band only if new station is multiplier; ops may use spotting networks.

Exchange

RST plus CQ Zone number. JAs will send RST plus Prefecture number (01 - 50). SCORE on 160m four points; 80m two points; 40/20/15m one point; 10m two points.

Scoring

The multiplier is total JA prefectures and JDI islands worked (possible 50 per band).

Multiply total points by the multipliers.

LOGS (one per call sign) must show times in UTC; exchanges; multiplier first time worked; duplicate QSOs shown as no points; rest periods clearly marked; use separate sheet for each band.

Send logs and summary sheet to: JIDX Contest, c/o Five-Nine Magazine, PO Box 59, Kamata, Tokyo 144, Japan, by 28 Feb, 31 May or 31 Dec.

Logs may be submitted on 3.5 inch disk in ASCII with summary sheet, or by e-mail. For instructions send e-mail to <jidx-info@nc.nal.go.jp> with command #get jidxlog.eng or #get jidxlog.jp

INTRUDER WATCH

Gordon Loveday VK4KAL

At the end of October, I received some reliable news, which may be rejected by most amateurs. How many operators have considered that the 3.5 to 3.7 MHz portion of the 80m band is only used by the amateur fraternity? We have all heard about Radio Pyongyang in North Korea on 3.560 MHz. Have you considered that this station might be operating legally?

Not all countries are members of the ITU and some members still go their own way in region 3. There are more than 2,667 legal operators in 3.5-3.7 MHz and 7,725 across

the 3 regions. None are in Australia thankfully. This shows how many registered users of the band there are.

This being so, we should be aware that the Amateur Service does not have 80m exclusively to itself. I've hinted at this before, maybe in not such a blunt way. We ALL have to learn to live with the situation and it can be done quite easily. Have patience picking your frequency. It is about time "frequency claiming" was stamped out, it is not the Amateur code.

A review of all illegal operations I have recorded since 1990 showed that the majority are listed as once only. They possibly "offend" daily under another callign, (if any) or on another frequency. This fills my records with useless info with no chance of getting a "conviction" and represent little more than nuisance value reports. How genuine is the Amateur about getting the intruder removed?

I stress again; **single reports are useless.** An observer sincere about removing an offender must listen daily on the frequency for at least 10 minutes, to ascertain if the intruder is the "desired" one: a repeat offender.

Single reports are only left on my system for 2 months.

NB: At present my Freepost is under review. So until further advised please use 56 Keilambate Road Rubyvale Qld 4702.

Thank you.

Gordon Loveday FIWC

ar

73

Bob Harper VK4KNH

HERE IT IS the end of another year, and for me

another job. That's right I am not continuing in my current role with AR although I expect to submit materials from time to time. Bill Rice is taking his well-earned rest with the knowledge that he is the longest serving Editor of AR. That alone deserves applause but the quality of his input has been excellent and it will be strange to not be receiving his corrections. I have to say that he has always been able to find errors that others have missed and has done so in less time than most would take to simply read the material.

In contrast to Bill's "Longest Serving Editor" title, I can claim to be the shortest serving as I was accepted as editor but my bid to produce AR was not successful. I was effectively editor for a few seconds. It was my decision to tie the two together and therefore I could not take up the appointment as Editor. I thank the divisions for their support of my application.

Colwyn Low has now been chosen and I trust that all the current contributors, both columnists and article writers will give him the support that I have been thankful for over the past year.

The AR team of contributors and editors are conscientious volunteers and their devotion and efforts should be recognised by the members in some form that endures. I suggest that the WIA present each with a Certificate of Appreciation for each year

of service to their fellow members. After all they are paid nothing and often spend their own money to help keep the magazine running.

This month we also lose Eric Jamieson VKSLP who has decided to retire and I know that there is an article in the pipeline on his contributions and experiences over the many years that he has written for AR. I look forward to reading that in January AR.

I was lucky enough to be on this AR team for one year and it was I think a good year. We have seen a lot of well-written articles and many by one particular person - Drew Diamond VK3XU.

I would like to personally thank Drew for his high quality, truly professional approach to his writing and for the variety of material he submits. His articles rarely need editing and invariably when I do find a spelling that I am not sure of, Drew's spelling is usually correct. His diagrams are so well drawn, not to mention detailed, that they never need redrafting. He provides crisp clear photographs that contain just the right balance of detail. In short, he has provided top quality, complex articles at the rate of at least one a month. Now that is dedication!

Many other columnists and article writers have provided materials of a very professional nature and I doubt that the average member would realise the work that it takes to produce AR every month. Yet the scant feedback that we receive is often negative or requesting content that we

would happily publish if we received suitable material.

In my humble opinion the magazine already covers a wide range of topics but would benefit from some construction articles on Microwave, ATV and perhaps Repeaters. Where are the beam antenna articles that were once in almost every radio magazine?

From the technical angle we obviously have some very talented writers out there and some that write articles for the IREE, IEEE, and other engineering societies. Perhaps a version in layman terms for AR would be fairly easy to produce.

There are other members working for Universities and TAFE. They no doubt write teaching notes that could be adapted to AR for those of us that need a better grounding.

We need to nurture the High School Teachers both to write on basic topics and to develop an interest in AR among students. As I see it if there are no new Radio Amateurs there will soon be no Amateur Radio.

What do I wish for this Christmas - some renewed public enthusiasm in AR, some new interests, and some new members?

What do I think all amateurs should have as their New Year Resolutions the first of January, 2000? To bring at least one new person into our hobby, to make better use of our bands, to use at least one new band, to build at least one home brew item, to make the image of Amateur Radio shine in the eyes of the public.

Merry Christmas and a Happy New Year, Bob VK4KNH

SPOTLIGHT on SWLING

by Robin L. Harwood VK7RH

5 Helen Street, Newcastle Tasmania 7250

(03) 6344 2324

E-mail: robroy@tassie.net.au

In a few weeks, this year of 1999 will be over as will the Millennium. This will be extensively covered in all the print and electronic media as you would expect. However the primary focus is going to be on the unknown effects of the Year 2000 or Y2K bug. This bug has the potential to disrupt everyday life throughout the entire Globe. Programmers once wrote years in two digits instead of four, which has led to some programs potentially failing when the number changes from 99 to 00. The first individual who first spotted this anomaly was scoffed and ignored. He apparently wrote a simple correcting code on his C64 computer and if it had been adopted as standard then, literally billions of dollars could have been saved.

Eventually the realisation that there was a huge problem as computers had proliferated throughout the world, all programmed with 2 digits instead of four for the years. Since then, governments and the commercial sector have been frantically working to see if their systems are Y2K compliant before December 31st at midnight local time or UTC. Some have cautiously opted not to take any chances. The Australian Stock Exchange will not trade on December 31st. Ansett Airlines will not be flying any aircraft between 11 p.m. and 12 noon the next day. Also emergency services are on standby not only here in Australia but in other nations on New Year's Eve and beyond.

In North America there have been several major nationwide exercises of emergency services held over the past three months in preparation for any eventuality resulting from the Y2K bug. Because of the possibility of power, telephone and satellites being down, it was realised that co-ordination would have to be primarily over high frequency and in voice. My American and Canadian contacts say that there is likely to be intense activity on the utility frequencies between 5.2 and 5.3 MHz, 10.2 to 11.00 MHz, 13.8 to 14 MHz and locally over VHF/UHF.

The only local reports of the effects I have heard of Y2K are of a Tasmanian council, who made a big statement that they were Y2K compliant, apparently issuing summons for parking fine defaulters to

appear in court on a date in February 1900. Red-faced officials hurriedly withdrew these and sent them out with the correct year.

The end of the Millennium has been the focus of many programs over international broadcasters. Over the past year, the BBC World Service has been airing retrospective programs looking back over the 20th century, a format also adopted by others. However as Britain's Royal Observatory and the American National Bureau of Standards has pointed out, the century actually does not end until December 31st 2000. This has been ignored by the Public and Media alike, choosing instead to pursue the perception that it is going to end this year.

The Sydney to Hobart Yacht race is on this year after last year's traumatic event. Substantial changes have been made to safety and all yachts must now be fitted with satellite tracking transponders allowing the controllers to instantly ascertain their location. I do not know if HF will continue to be utilised as it has in previous years, although HF is still mandatory on yachts. The channels of 2182, 4125 and 4483 kHz should be monitored yet I find that 2524 kHz is always active with other races being held concurrently.

Radio New Zealand International has been stuck on 17675 kHz since the failure of a switch. I do not know when they will resume on the lower channels in the evening hours. The broadcaster now has to pay commercial rates for their relays of the private Radio Sport network. Apparently RNZI are looking for a sponsor to pay out US\$37,000 to continue shortwave relays of these. Many listeners have been puzzled because Radio Sports apparently relays a Florida sports network overnight complete with American commercials and RNZI has relayed these when they have been carrying special overnight broadcasts of Sport involving New Zealanders.

I was extremely disappointed to miss out hearing the final shortwave broadcast from Radio St Helena on Sunday October 23rd. The transmission was on 11092.5 kHz from a disused Cable & Wireless USB transmitter. Propagation was poor and I was

also experiencing severe splatter from China National Radio on 11100 kHz. Monitors on the East Coast of North America were indeed fortunate and the signals made it to Europe yet were not as good as last year. The transmitter has now been permanently retired yet I believe that enthusiasts are eagerly hunting around for another transmitter to continue these semi-annual broadcasts.

Incidentally I can confirm that East Timor is off HF after the Indonesians turned off the senders and departed with them. There are moves to re-establish a community radio network primarily on FM with Australian aid. I don't know when HF will be reactivated yet no doubt it will. Timor is pretty mountainous and a substantial number of Timorese are in Australia, Indonesia and in Portugal. East Timor will be under UN administration until full independence and they too will probably have a network.

In conclusion, may I extend my best wishes for the Season and hope that 2000 will be a happy one as we start the millennium. I also hope that you are not inconvenienced by Y2K, if it is at all.

Good monitoring and 73

Robin L Harwood VK7RH

ar

Another Carol to sing round the Xmas tree

by Bob Harper VK4KNH

Jingling Valves

Chorus

Jingling valves, rattling valves,

Stored for another day,

You know how to make a regen go,

To tune in Santa's Sleigh.

Santa was a ham,

With lots of skeds to keep,

What do you think he does at night,

When the elves are sound asleep.

Chorus

Tuning HF bands,

He stays up all the nights,

Reflecting lots of QRP,

Off all those northern lights.

Chorus

Now every little ham,

Off to their bed should go,

To listen for the little bells

And for that Ho, Ho Ho.

by Evan Jarman VK3ANI

34 Alandale Court, Blackburn Vic 3130

December

1999

T index: 148

Legend

UD

F-MUF

E-MUF

OWF

ALF

10%-30%

30%-90%

90%-100%

Time scale

These graphs show the predicted diurnal variation of key frequencies for the nominated circuits.

These frequencies as identified in the legend are:-

- Upper Decile (F-layer)
- F-layer Maximum Usable Frequency
- E-layer Maximum Usable Frequency
- Optimum Working Frequency (F-layer)
- Absorption Limiting Frequency (D region)

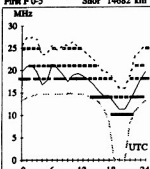
Shown hourly are the highest frequency amateur bands between these key frequencies: when usable. The path, propagation mode and Australian terminal bearing are also given for each circuit.

These predictions were made with the Ionospheric Prediction Service program: ASAPS version 4.

ar

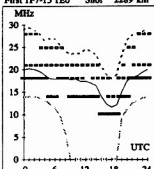
Adelaide-Accra 242

First F 0-5 Shor 14682 km



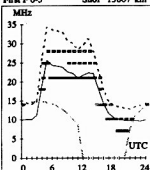
Brisbane-Auckland 123

First 1F7-15 1E0 Shor 2289 km



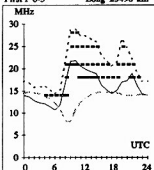
Adelaide-Moscow 318

First F 0-5 Shor 13807 km



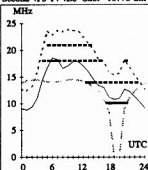
Brisbane-London 147

First F 0-5 Long 23498 km



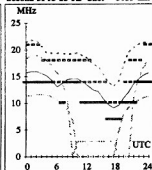
Canberra-Capetown 219

Second 4F5-14 4E0 Shor 10778 km



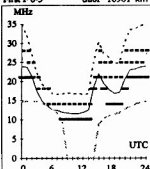
Darwin-Invercargill 144

Second 3F13-23 3E Shor 5159 km



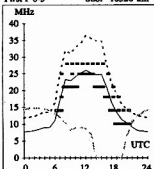
Adelaide-Ottawa 58

First F 0-5 Shor 16901 km



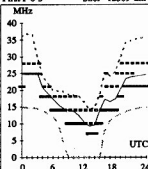
Brisbane-London 327

First F 0-5 Shor 16526 km



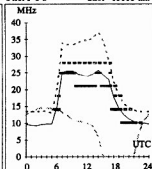
Canberra-Los Angeles 62

First F 0-5 Shor 12309 km



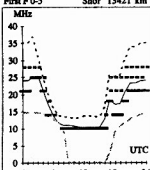
Darwin-Paris 322

First F 0-5 Shor 13818 km



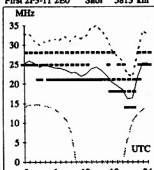
Adelaide-Vancouver 49

First F 0-5 Shor 13421 km



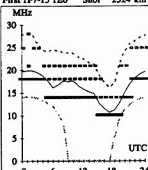
Brisbane-Manila 320

First 2F3-11 2E0 Shor 5813 km



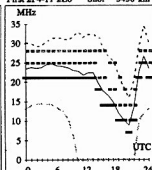
Canberra-Wellington 115

First 1F7-15 1E0 Shor 2324 km

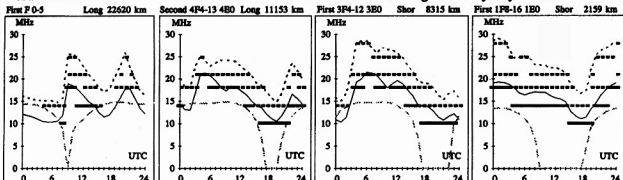


Darwin-Tokyo 10

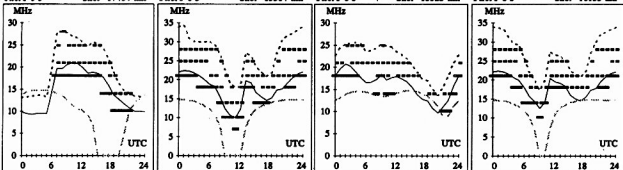
First 2F4-11 2E0 Shor 5436 km



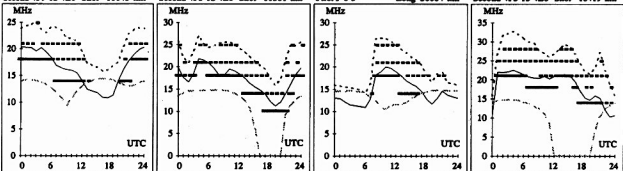
Hobart-London 123 **Melbourne-Lusaka** 241 **Perth-Johannesburg** 248 **Sydney-Auckland** 106



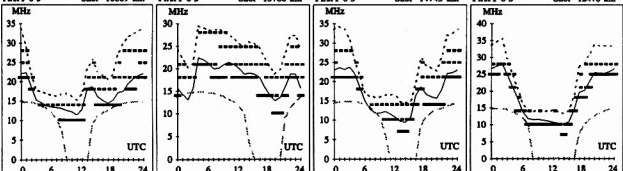
Hobart-London 303 **Melbourne-Miami** 94 **Perth-Rio de Janeiro** 203 **Sydney-Barbados** 119



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• **Kenwood DFC230** external VFO for TS1205/V txcvrs c/w cables mounting bracket manual and microphone s/n 1041377 \$120 Ph Eric VK1EP 02 6249 6907 QTHR.

FOR SALE NSW

• **YAESU FT107** one owner YM35mic AC power supply, replacement. DSE service manual, mint condition WARC \$500 plus freight. Allan VK2AGR 02 4471 1059 Lic'd hams only.

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• **Internet Flea Market** - see the Waverley Amateur Radio Society's website for club and members items for sale and wanted. Its URL is http://www.zip.com.au/~sb/wars/w_flea.htm

FOR SALE VIC

• **DSE 3-15v 25amp** regulated power supply, D3800 twin meters EC \$210. Kenwood PG-3G DC line noise filter 25 amp new, \$35. Comet C-400 SWR & power meter 430-450 MHz and UHF CB. As new \$55. Len VK3BMY 03 5862 3116.

• **Yagi antenna**, 6m 3 El. Good condition, gamma matched. CUSHCRAFT 6m Ringo, near new, plus 18 (60ft) RG218 coax cable with PL259 plugs and also ATU for 6m, These 4 items for only \$85 the lot. (ex QTH) EMTRON EP-2000 cross needle meter for SWR/PWR. 20/200/2000 watts, 1.8 to 60MHz. As new, \$75. Equipment console, laminex desk level, 3 upper shelves and 1 shelf underneath plus 2 storage cabinets, plenty leg room. 5 double power points, circuit breaker and AC voltmeter. Solid construction. Ready to plug in and use. Easy to transport in two sections. Dimensions H5' 10", W4' 10", D2'. Worth inspection \$65 o.n.o. Andy VK3JUF QTHR 03 9726 8879

• **Kenwood power mic** MC60A 18 months old s/n 122 \$130. VK3NR 03 9367 6910. Kenwood headphone HSS0. 1 year old. \$105. VK3NR Jim.

• **Tower** - 40ft wind up lattice includes all necessary hardware in good condition. \$350. Ph Michael VK3MRG 03 9747 9342 A.H.

• **High voltage power supply**, 2500V @ 500mA, 1A pk. Huge oil filled transformer, oil filled block paper capacitors, soft start. Beautifully made, 260W x 570D x 490H, \$250. Single band power

amplifier (40m CW), 900W output, good working order, could rebias for SSB, \$90. Peter VK3APN QTHR (03) 9337 9981 pnesbit@melbpc.org.au

• One 90ft wind up telescopic lattice tower with base. Good condition. Phone Dave VK3JKY 03 59774808

FOR SALE SA

• **Kenwood TS-130S** \$450. AT-130 ATU \$120 120 Ext VFO \$120. MC \$50 desk mic \$80. Mobile bracket \$60. Sell lot \$800. More for sale send a s e for list. VK5MAP Paul. QTHR 08 8651 2398

• **TS-430S HF** transceiver with optional filters, service manual, in original carton. Excellent condition. \$900 o.n.o. David - Clark headset with NATO plug and adaptor. Suitable for helicopters. Excellent condition \$300 o.n.o. John VK5KBE QTHR. 08 8250 7259

• **CREATE** model RC5 antenna rotator serial No 043397E. Manual. 40mtrs connecting cable. Little used. \$350. Derek VK5AFP QTHR 0883830447. Email: glenhardy@chariot.net.au

• **AR7 Power Supply**, Kingsley Radio and RAAF identification plates on front panel, 12VDC/240VAC PSU type as shown in the AR7 manual, with spare 6X5GT valves, \$40. Norbert VK5MQ (08) 87230315 QTHR

FOR SALE WA

• **CUSHCRAFT R-7** seven band vertical. This 5/8 wave antenna gives 3db advantage over the normal 1/4 wave ground plane. Doesn't need cumbersome radials \$300. Call MARV VK6WW 08 9375 5946.

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• **1 TONO 150 watt** all mode linear amp with switchable preamp, as new with book and box, \$300 FIRM. 1 Oskerblock VHF/UHF SWR/POWER meter, perfect condition with instructions \$100 FIRM. 1 HF SWR/POWER meter with twin meters is rated at 100watts perfect condition, \$80 o.n.o. 3 **Kenwood MB-403** mobile mounting brackets, new in boxes to suit TS-430/440 etc \$30 ea FIRM. 300 5 1/4 floppy disks some have programs, the lot \$20. 1 ICOM IC-71A communications receiver, this unit is in perfect condition and comes with leads and instruction manual. \$750 FIRM. **Kenwood TH-78A FM** dual band hand held in mint condition with charger handbook and box, it also comes with these optional extras, carry case, SMC33 speaker/microphone, BT-8 dry cell battery case, and car cigarette lighter power charger/regulator, \$600 o.n.o. 1 MH-1 B8 YAESU microphone, brand new in box, \$50 FIRM. 1 **Kenwood SW200-A SWR/Power** control head, in good condition in original box, no couplers. \$100 FIRM. 1 **grid dip meter**, home brew, very good condition, \$40 FIRM. **Approx 300 brand new boxed radio** and TV valves to be sold as one lot \$100 FIRM. 1 **Toshiba 386** laptop docking station \$25. 1 **Compaq 386** laptop docking station \$25. Ph David VK7ZSDJ 03 6425 2030, mobile 0413 219 680

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 a not-for-profit site that is a
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WANTED NSW

- **691DM** all mode transceiver. Ros VK2ZRE QTHR 02 6454 2249
- **Kenwood ATU180** Tony VK2VIC Ph 0412 809 590 or email tonestar @ interact.net.au
- **YAESU FC10** auto tuner or equiv. VK2VUX Ph 02 6772 3006. Fax 02 67723996
- **Old valve receivers** no matter what condition. Manuals parts all welcome. Don't throw it out, give me a call. Specialist in big, heavy sets. Call John 02 9533 6261
- **6M Multi Mode** Transceiver or Transverter to suit FT 101E. Jim VK2ZVJ.(02) 4443 2277 or Email brownsarre@fastrac.net.au.

WANTED VIC

- **Two Philips UHF FM 828** transceivers T band in good condition. To be used for UHF links in the East Gippsland Repeater network. Details to Bob VK3ZAN. Ph 03 51567654. or Paket VK3ZAN@VK3BVP.Vic. or Email Bobprille@net-tec.com.au
- **AMR100** receiver made by AWA during WWII. Also looking for a Barlow Wadley XCR-30 mark 2. Contact Fred VK3JM 03 9801 4972
- **Hi-mound MK 701** paddle for EL keyer also meter for FT-101E. Lindsay VK3ANJ 03 5155 1380

WANTED QLD

- **Wanted 7289**, 3CX100A5 or similar tubes. Used pullouts fine. PH 07 4972 9811 Stuart VK4YFI
- **YAESU FT101B** instruction manual; 6JS6C power amplifier tubes. Any 101B accessories. Kenwood SP520 speaker matches TS520S DS-1A DC-DC converter; AT-200 ATU. Kenwood TL922 working or not. HENRY linear amplifier HF console model preferred. Tubes 572B; 6146B; 3-5002G John Abbott VK4SKY 0417 410 503 PO Box 1166 Coolangatta 4225 QLD.

MISCELLANEOUS VIC

- **Geelong Radio and Electronics Society.** Hundreds of antique to modern radio items from chassis to complete sets. Surplus from our electronic and museum collection. Full listing, additional information and contacts on web site <http://www.pccare.net.au/~keithv/> Auction on Sunday 26th February 2000 at GRES clubrooms.

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This saves excessive corrections by the proofreader, and reduces the chance of errors being published, which inconveniences everyone.

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<www.cyberelectric.net.au/~rjandusimports>

Agencies at: Assoc TV Service, Hobart; Truscotts Electronic World, Melbourne and Mildura; Alpha Tango Products, Perth; Haven Electronics, Nowra

- **WEATHER FAX** programs for IBM XT/ATs *** "RADFAXZ" \$35.00, is a high resolution

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and a
Happy and Prosperous
New Year.

WIA Division Directory

The WIA consists of seven autonomous State Divisions. Each member of the WIA is a member of a Division, usually in their residential State or Territory, and each Division looks after amateur radio affairs within its area.

Division	Address Officers	News Broadcasts	Note: All times are local. All frequencies MHz.	Fees
VK1 ACT Division GPO Box 600 Canberra ACT 2601	President: Gilbert Hughes Secretary: John Woolner Treasurer: Les Davey	VK1GH VK1ET VK1LD	VK1W: 3.570 LSB, 146.950 FM each Sunday evening from 8.00pm local time. The broadcast text is available on packet, on Internet aus.radio.amateur.misc new group, and on the VK1 Home Page http://www.vk1.wia.amprg	(F) \$72.00 (G) (S) \$58.00 (X) \$44.00
VK2 NSW Division 109 Wigram St Parramatta NSW (Office hours Mon-Fri 1100-1400) (PO Box 1066, Parramatta 2124) Phone 02 9689 2417 Freecall 1800 817 644 Fax 02 9633 1525	President: Michael Corbin Secretary: Eric Fossey Treasurer: Eric Van De Weyer Web: http://marconi.mpce.mq.edu.au/wia e-mail: vk2w@ozemail.com.au	VK2YC VK2EYF VK2KUR	From VK2W 1.845, 3.595, 7.146*, 10.125, 14.160, 24.950, 28.320, 29.120, 52.120, 52.525, 144.150, 147.000, 438.525, 1281.750 (* morning only) with relays to some of 18.120, 21.170, 584.750 ATV sound. Many country regions relay on 2 m or 70 cm repeaters. Sunday at 1000 and 1930. Highlights included in VK2AWX Newcastle news, Monday 1930 on 3.593 plus 10 m, 2 m, 70 cm, 23 cm. The broadcast text is available on the Internet newsgroup aus.radio.amateur.misc , and on packet radio.	(F) \$89.00 (G) (S) \$56.00 (X) \$41.00
VK3 Victorian Division 40G Victory Boulevard Ashburton VIC 3147 (Office hours Tue & Thur 0830-1530) Phone 03 9885 9261 Fax 03 9885 9298	President: Jim Linton CEO: Barry Wilton Secretary: Peter Mill Web: http://www.tbss.com.au/~wla/vic/ e-mail: vk3w@rnt.com.au	VK3PC VK3XV VK3APO	VK3BW broadcasts on the 1st and 3rd Sunday of the month at 8.00pm. Primary frequencies, 3.615 LSB, 7.085 LSB, and FM(R)s VK3RML 146.700, VK3RMM 147.250, VK3RWG 147.225, and 70 cm FM(R)s VK3ROU 438.225, and VK3RMD 438.075. Major news under call VK3WI on Victorian packet BBS and WIA VIC Web Site.	(F) \$75.00 (G) (S) \$61.00 (X) \$47.00
VK4 Queensland Division GPO Box 638 Brisbane QLD 4001 Phone 07 5496 4714	President: Colin Gladstone Secretary: Peter Harding Treasurer: Alistair Erick e-mail: wiaq@brisbane.digitx.com.au Web: http://www.wiaq.powerup.com.au	VK4ACG VK4JPH VK4FTL	VK4WIA: 1.825 MHz SSB, 3.605 MHz SSB, 7.118 MHz SSB, 14.342 MHz SSB, 21.175 MHz, 28.400 MHz SSB, 29.220 MHz FM, 53.725 MHz FM, 147.000 MHz FM, 438.500 MHz (Brisbane only), and regional VHF/UHF repeaters at 0900 hrs EAST Sunday. Repeated on 3.605 MHz SSB & 147.000 MHz FM at 1930 hrs EAST Monday. Broadcast news in text form on packet under WIAQ/VKNET.	(F) \$74.00 (G) (S) \$60.00 (X) \$46.00
VK5 South Australian Division (GPO Box 1234 Adelaide SA 5001) Phone 08 8294 2992	President: Jim McLachlan Secretary: David Minchin Treasurer: John Butler	VK5NB VK5KK VK5NX	VK5W: 1827 kHz AM, 3.550 MHz LSB, 7.095 AM, 14.175 USB, 28.470 USB, 53.100 FM, 147.000 FM Adelaide, 146.700 FM Mid North, 146.800 FM Midlura, 146.825 FM Barossa Valley, 146.900 FM South East, 146.925 FM Central North, 147.825 FM Gawler, 438.425 FM Barossa Valley, 438.475 FM Adelaide North, ATV Ch 35 579.250 Adelaide. (NT) 3.555 USB, 7.065 USB, 10.125 USB, 146.700 FM, 0900 hrs Sunday, 3.585 MHz and 146.675 MHz FM Adelaide, 1930 hrs Monday.	(F) \$75.00 (G) (S) \$61.00 (X) \$47.00
VK6 West Australian Division PO Box 10 West Perth WA 6872 Phone 08 9351 8873	Acting Pres. Cliff Bastin Secretary: Christine Bastin Treasurer: Bruce Hedland-Thomas Web: http://www.faroc.com.au/~vk6wia/ e-mail: vk6wia@faroc.com.au	VK6LZ VK6ZLZ VK6OO	VK6WIA: 146.700 FM(R) Perth at 0930hrs Sunday relayed on 1.825, 3.590, 7.075, 14.116, 14.175, 21.185, 29.680 FM, 50.150 and 438.525 MHz, country relays 3.582, 147.200 (R) Cataby, 147.350 (R) Busselton and 146.900 (R) Mt William (Bunbury). Broadcast repeated on 146.700 at 1900 hrs Sunday relayed on 1.865, 3.565 and 438.525 MHz : country relays on 146.350 and 146.900 MHz.	(F) \$62.00 (G) (S) \$50.00 (X) \$34.00
VK7 Tasmanian Division PO Box 271 Riverside TAS 7250 Phone 03 6425 2923 Fax 03 6425 2923	President: Ron Churcher Secretary: Tony Bedelph Treasurer: John Bates Web: http://www.wia.tasnet.net	VK7RN VK7AX VK7RT	VK7W: 146.700 MHz FM (VK7RHT) at 0930 hrs Sunday relayed on 147.000 (VK7RAA), 146.725 (VK7RNE), 146.625 (VK7RMD), 3.570, 7.090, 14.130, 52.100, 144.150 (Hobart), repeated Tues 3.590 at 1930 hrs.	(F) \$74.00 (G) (S) \$60.00 (X) \$46.00
VK8 Northern Territory (part of the VK5 Division and relays broadcasts from VK5 as shown, received on 14 or 28 MHz).				

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